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PATENTS FOR INVENTIONS.

ABRIDGMENTS
OF
Specifications
RELATING TO
ARTISTS' INSTRUMENTS AND MATERIALS.

A.D. 1618–1866.

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PREFACE.

THE Indexes to Patents are now so numerous and costly as to render their purchase inconvenient to a large number of inventors and others, to whom they have become indispensable.

To obviate this difficulty, short abstracts or abridgments of the Specifications of Patents under each head of invention have been prepared for publication separately, and so arranged as to form at once a Chronological, Alphabetical, Subject-matter, and Reference Index to the class to which they relate. As these publications do not supersede the necessity for consulting the Specifications, the prices at which the printed copies of the latter are sold have been added.

The number of Specifications from the earliest period to the end of the year 1866 amounts to 59,222. A large proportion of the Specifications enrolled under the old law, previous to 1852, embrace several distinct inventions, and many of those filed under the new law of 1852 indicate various applications of the single invention to which the Patent is limited. Considering, therefore, the large number of inventions and applications of inventions to be separately dealt with, it cannot be doubted that several properly belonging to the group which forms the subject of this volume have been overlooked. In the progress of the whole work such omissions will, from time to time, become apparent, and be supplied in future editions.

This volume contains Abridgments of Specifications to the end of the year 1866. From that date the Abridgments will be found in chronological order in the "Chronological "and Descriptive Index" (*see* List of Works at the end of this book). It is intended, however, to publish these Abridgments in classes as soon as the Abridgments of all the Specifications from the earliest period to the end of 1866 have appeared in a classified form. Until that takes place, the reader (by the aid of the Subject-matter Index for each year) can continue his examination of the Abridgments relating to the subject of his search in the Chronological and Descriptive Index.

The specifications abridged in the present series relate to pencils, pencil holders, crayons, crayon holders, instruments for sharpening lead pencils and crayons, brushes, palettes, palette knives, colour boxes and cases, easels, contrivances for sketching, tracing, copying, and multiplying copies, such mathematical instruments as are used in linear drawing, and some optical instruments, as, for example, the kaleidoscope, the camera lucida, &c.

There are included also the manufacture of artists' colours and varnishes as distinguished from colours and varnishes employed in house painting, the preparation of canvas and other substances on which pictures may be painted (provided the specification states that the substances are applicable to such purpose), the colouring of photographs, methods of drawing and painting (by hand) on glass, china, and the like, and the processes of delineating and preparing panoramas, but not the mechanical means of displaying them or similar exhibitions. The inventions relating to "ever-pointed pencils" are not included, but will be found in the series entitled "Writing Instruments and Materials."

The Abridgments marked thus (* *) in the following pages were prepared for another series or class, and have been transferred therefrom to this volume.

B. WOODCROFT.

February, 1872.

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INTRODUCTION.

Who can decide what nation produced the first painter or sculpter? Some suppose that sculpture is the more ancient art; some that painting originated in the ornamentation of woven fabrics or from the colouring of statues and reliefs, and some that pottery was the parent of the arts. Mr. Haydon remarks in his first lecture, "the very first man born after the creation “ with such a peculiar and intense sensibility to receive impres- “ sions through the eye on the brain, of the beauty of colour, “ light and shadow, and form, so as to be irresistibly impelled “ to attempt the imitation of what he saw and felt by lines and “ colours, originated painting."

There is no mention made in the earliest books of the Bible of drawing or designing, nor of painting, although we read in Exodus xxviii. of engraving. The poems of Homer do not contain any allusion to painting as an imitative art, but the ships of Ulysses are described as red-cheeked; ivory stained or dyed with purple is introduced in a simile; and elaborate embroidery is mentioned as something not uncommon. Herodotus in his description of Egypt (book ii.) uses words equivalent to painters and sculptors.

It is generally agreed that the first and simplest form of designing or drawing was an outline in black or white called a skiagram. The second was called a monogram and consisted of “ the complete outline with the inner markings, still without “ colour, such as we find upon the ancient vases, or such as the “ celebrated designs of Flaxman which are perfect monograms" (Dict. Antiq. art. Painting). The third was the outline filled up with one single colour and thence called monochrom. The fourth was a gradual advance to the polychrom or picture of many colours; in the course of time light and shade were introduced, and a picture was produced perfect in everything essential.

If the legends relating to the origin of drawing or rather skiagraphy have not any historical value, they are interesting to the lovers of art. One of them recorded by Pliny (book xxxv.) runs thus :—The daughter of Butades (or Dibutades), a potter of Sicyon, drew an outline of her lover's face (which was cast by her lamp) on the wall. Her father was so struck with the likeness that he took an impression in clay and baked it with the rest of his pottery. This production was preserved in Corinth until the destruction of the city by Mummius, B.C. 146. There were however, as may be supposed, several other claimants to the honour of the invention. Pliny (book vii.) states that Gyges, a Lydian, invented painting (*pictura*) in Egypt, and Euchir (a relation of Daedalus) in Greece.

Painting may be divided into *tempera, water-colour, fresco, encaustic*, and *oil*. *Tempera* is generally allowed to be the most ancient method ; it is so named because the colours were tempered or diluted with a medium neither oil nor simple water, the chief ingredient being white of egg or an equivalent. Other ingredients, such as glutinous matters, size, and milk were used according to circumstances. "Many of the ancient ornamental " friezes and painted bassi-relievi in the temples and ruins in Egypt and also many of the most ancient remains in Italy are " painted in this manner" (Dict. Antiq.).

Water-colour.—This method it may be fairly inferred is of great antiquity, being closely connected with tempera and fresco, so far as relates to the mixing of the colours. Although we find no especial reference to it in ancient writers, the sponge mentioned by Pliny (book xxxv.) and by other writers in connection with painting "affords some proof that painting in water-colours " was the method generally practised by the ancient painters" (Dict. Antiq.).

Fresco.—This is described by Vasari as "truly the most virile, " most sure, most resolute, and durable," of all methods of painting, and consequently the best fitted for the purpose of historical painting in its most exalted form. Mr. W. Cave Thomas in his work on "Mural Decoration" defines fresco to be "the method of painting upon fresh-floated mortar with " water-colour, that is neither with the cake nor with the moist " colours in common use, but with the raw pigments mixed with " either pure water or hydrate of lime." He further informs us that "the colours are chiefly simple earths ; no vegetable and " few mineral preparations can be used with safety ; they are " mixed with or ground in water and kept in jars ;" and again that the Intonaco or coat of fine mortar applied to the wall as a ground for fresco painting should be of "two parts sand and one "part lime, carefully prepared," In the article "Painting" in the Dict. Antiq. we are told that the care and skill required to execute a work in fresco, and the tedious and expensive process of preparing the walls, must have effectually excluded it from ordinary places. The majority of the walls in Pompeii are in common distemper, but those of the better houses, not only in Pompeii but in Rome and elsewhere, are in fresco. Some modern critics have raised the question "Did the ancients paint in *true fresco*?" From artistic and chemical examination of ancient paintings they infer that the joinings in the plaster are at too great intervals for the work included to have been executed before the plaster was dry, and that these lines do not coincide with the outlines of the design. "It appears the most reasonable to con-"clude that the wall-paintings of the ancients were executed by "the method known as *fresco secco*" (Gullick). The walls when painted were coated with an encaustic varnish.

Encaustic or wax-painting.—The explanations given of this mode of painting are "almost inextricably confused and con-"tradictory" (Gullick). There were originally two distinct methods (one with wax, the other on ivory), a third being employed, says Pliny (book xxxv.), when ships began to be painted. In the first, a heated graver, pointed at one end and broad and flat at the other, was used. The variously coloured wax pigments were prepared in cakes or sticks, and the graver "was used much "in the same way as Turner and other painters have dexterously "handled the palette-knife, drawing with the point and regulating "the impasto or body of colour with the side of the instru-"ment" (Gullick). In the second, the point of the graver was used for the purpose of actually engraving on ivory outlines which were afterwards filled in with coloured wax. Sir Charles Eastlake is of opinion that the outlines were first drawn on waxed ivory and afterwards engraved like a seal; that the finished and shadowed design was filled in with one or more colours and ultimately covered with a wax varnish by the aid of heat. In the third, a brush was substituted for the graver. The colours mixed with wax were heated, and when applied a *cauterium* (a pan of live charcoal or equivalent) was held before the picture until the colours sweated, and this regulated fusion united the whole surface. Although wax was undoubtedly an essential ingredient in encaustic colours, there must have been also gum or resin to harden them. "Encaustic was in very little use by the "earlier painters (Greek and Roman), and was not generally "adopted until after the time of Alexander" (Dict. Antiq.).

Oil-painting was unknown to the ancients; this may be concluded from the total absence of all even incidental reference by classical authors to the subject. Oils of some kind entered into the composition of varnishes from the remotest antiquity, and that is all that can be established. Vitruvius (book vii.) states that the wax with which walls were coated (after painting) was mixed with oil. Pliny (book xxxiii.) makes the same remark, and in book iv. writes that resin of all kinds is melted in oil. Aetius, a medical writer of the 5th century, says that walnut oil is used by gilders and encaustic painters. "On the evidence of "an MS. at Lucca we are to refer the important introduction of "linseed oil into the arts to the 8th century" (Gullick).

The invention, or at all events the introduction of oil-painting, is almost universally assigned to John Van Eyck in the earlier part of the 15th century. "If Van Eyck may not be allowed "the honour due to an original discoverer, he cannot be denied "the merit of having carried the preparation and use of colours "to a degree of perfection which has never been surpassed" (Taylor's edition of Merimée's Art of Painting). Pilkington in his Dictionary of Painters, describes the experiments by means of which Van Eyck made his discovery, adding "there is evidence "however on record in our Exchequer Rolls that oil was "employed by painters at least a century before the period in "question, and that the method was practised in Italy as early as "the 11th century." This evidence is not altogether trustworthy; the words *vernix* and *vernice* when used alone are supposed by some to mean *dry resin*. "It was only in the 16th "century that the word in the form of *vernice* was applied to "liquid compositions" (Gullick). Pilkington allows that Van Eyck "was the first who rendered oil-painting general and "improved its process."

Mr. W. C. Thomas observes that "the introduction of oil-"painting gradually changed the whole character of pictorial "art; it rendered the painter independent of the architect, for "before that time painters were chiefly occupied in decorating the "walls of public buildings, and were restrained in the treatment "and effects of their works by architectonic conditions and "method of execution. Pictures on panel and canvas gradually "increased in number as mural painting declined."

Portrait-painting.—Portraiture seems to be almost as ancient as the art of painting; this may be inferred from the before-mentioned profile taken by the Corinthian damsel. "The most "ancient portraits extant, if they can be termed such, are those "which have been found in the cases of mummies; there is a "singularly fine specimen of these preserved in the Egyptian "Museum of the Louvre in Paris, and there is also one of mean "execution in the British Museum" (Pen. Cyc). Among the most celebrated portrait painters of Greece, classical writers mention Polygnotus (B. C. 463), Dionysius his contemporary, and *facile princeps* Apelles (about B. C. 332) to whom alone Alexander the great would sit for his portrait. It was a custom among the Romans in early times to have their portraits painted upon their shields; these were frequently dedicated in temples in honour of their owners when deceased, or by the victors as trophies. Marcus Varro, says Pliny (xxxv.), inserted in his works the portraits of 700 illustrious men.

Enamel has the great recommendation of being apparently indestructible. "Specimens of this art applied to pottery are now "in existence which have not changed their hues during 3000 "years. The enamel tints on Egyptian idols, scarabei, necklaces, "&c., are precisely similar to the colours now produced by the "enamellers" (Gullick). Enamelling is of great antiquity; it was practised by the Egyptians; it probably passed from them to the Greeks, and subsequently to the Romans who are supposed to have introduced the art into Britain.

"Enamel painting, which should be called painting on enamel, "is of modern date. It was indeed long believed that the "encaustic painting of the ancients was the same thing as our "enamel painting. But although the ancients possessed the art "of colouring glass, which might have led to enamel painting, "they do not seem to have acquired this latter art, the invention "of which, as it is practised in our days, is ascribed to the "French" (Pen. Cyc.) in the early part of the 17th century.

Mosaic.—This invention is of very ancient date; it appears to have been transmitted through the Egyptians to the Greeks, and by them to the Romans. The numerous specimens which have been discovered in England prove the opulence and luxury displayed by the Romans in their building, and "it may be fairly "taken for granted that decoration attended with such difficulty "and tediousness of execution, and requiring artificers of a "superior class, if not artists, was not introduced except in sumptuous edifices" (Pen. Cyc.). In the same article we are told that *pictures* in mosaic are comparatively of recent origin, dating not farther back than the commencement of the 17th century, when copies of celebrated works by Raphael and other masters were for the first time thus executed.

In the book Esther (I. 6) we read of "a pavement of red and "blue and white and black marble."

Pliny (xxxvi.) assigns the origin of mosaic pavement to the Greeks; he describes a celebrated mosaic by Sosus representing a floor with the relics of a supper left on it; he also states that Sulla was the first who caused a mosaic pavement to be made for the temple of Fortune at Praeneste, and that afterwards walls and ceilings were decorated with like work.

The most interesting and most valuable mosaic extant is the one discovered in 1831 in Pompeii, and supposed to represent the battle of Issus. "The composition is simple, forcible, and beautiful, and the design exhibits in many respects merits of the "highest order" (Dict. Antiq.); it displays throughout "thorough "understanding of perspective and foreshortening" (Gullick).

Engraving.—In the book Exodus mention is made of engraving on onyx stones and on a plate of pure gold. Bezaleel is there described as a man filled with wisdom of heart to work all manner of work with the graver as well as to devise cunning works; to work in gold and in silver and in brass, and in cutting of stones to set them. The hieroglyphics and other remains of Egyptian engraving are amongst the most ancient relics now extant; "but it is believed that some of the relics of Etruscan art "in the British Museum are of as high antiquity as any existing "specimens of engraving" (Pen. Cyc.). Herodotus (v. 49) writes that one of the earliest uses to which engraving was applied among the Greeks was the delineation of maps on metal plates. Aristagoras appeared before the King of Sparta with a tablet of brass on which was inscribed every part of the habitable world, the seas, and the rivers (B.C. 500).

Of what materials were the tools made with which the ancients engraved on precious stones, metals, &c.? Mr. Landseer is of opinion that the incisions were produced by patient perseverance *with steel* gravers impelled by blows with a mallet, and that the work was afterwards rendered smooth by friction with some hard pulverized substance. "The engravings of hieroglyphics on metal "as well as those of the ancient sarcophagi are evidently executed "with similar instruments to those now in use; some of the lines "narrowing downwards have clearly been cut with the lozenge-"shaped graver now chiefly used, but other lines being of the "same width through their whole depth must have been produced "with that species of graver called a scooper still used for "effecting broad incisions" (Pen. Cyc.).

Sculpture, statuary, modelling, and casting.—These arts (like that of painting) cannot be assigned to any particular nation or individual; "they spring up naturally in all countries and take "their origin alike everywhere in the imitative faculty of man" (Dict. Antiq.). They became so pre-eminently the arts of Greece that to the present day no other nation has produced artists superior to those of Greece; all still look upon the Greeks as the great masters and models for all ages. "So many mate-"rials presented themselves upon which the imitative faculty "could be exercised that there can be little doubt that rude "attempts at forming clay or other plastic substance into a "defined shape were among the first exercises of human inge-"nuity" (Pen. Cyc.). The ancients appear to have availed themselves of every known material capable of being employed in sculpture, namely, clay, wood of various kinds, ivory, stone, marble, gold, silver, bronze, and other metals. As a proof of the antiquity of these arts may be mentioned the images which Rachel carried off from her father's house, the molten calf, the brazen serpent, the names of Bezaleel and Aholiab, and the shield of Achilles described by Homer and Hesiod. "The style of sculp-"ture and the condition of the art at different periods among the "Persians, the Egyptians, the Etrurians, the Greeks, and the "Romans can fortunately be illustrated by reference to existing "remains" (Pen. Cyc.). The Greeks ascribed the art of casting in bronze and iron to Rhoecus and Theodorus of Samos (about B.C. 600).

Instruments.—Pliny does not tell us what instrument the damsel used when she drew the outline of her lover's face; his words are *lineis circumscripsit* (with lines she marked (or scratched?) around). The instruments mentioned in ancient writers are (1) a sort of graver pointed at one end and broad and flat at the other, and called γραφίς, stilus, cestrum, or viriculum; (2) the reed pen; (3) a brush *made of* animal hair and called ὑπογραφίς, ῥάβδιον, saetae, penicillus; (4) an easel or equivalent; (5) a palette; (6) a sponge; (7) a canterium (see *encaustic*).

The ancients used a palette very similar to that used by the moderns, and although there is no word found in any classical writer which is exactly equivalent to palette, "the fact however is " sufficiently attested by the figure of Painting discovered in the " so-called Pantheon at Pompeii which holds the palette and " brushes in her left hand" (Dict. Antiq.). In the same article it is stated that it is most probable that the *tabella* of Pliny and the πινάκιον of Pollux (or even the ϖυξίον, x. 59) signified palette as well as tablet. Palettes are by no means rare objects in museums of antiquities, and in Passalacqua's Catalogue Raisonné et Historique of discoveries made by him at Thebes and Memphis there is a description of a large and highly ornamented palette.

For modern fresco painting the instruments used are, according to Mr. Thomas, wooden and glass floats, trowels of wood and iron, palette-knives of steel and bone, a trimming knife, a bone or ivory stilus, brushes of hog and other hair, tin palettes with raised edges, and a stone slab on which to grind the white and mix the colours for the day's use.

The *camera obscura*, " the invention of Baptista Porta towards " the end of the 16th century, was simply a dark chamber furnished " with a single double-convex lens fitted in a tube and serving for " the focal adjustment of the image. So constructed, it was first " applied to the copying of different objects, the outlines of which " as given by the camera were traced upon the paper by a pencil, " but the image was reversed. This inconvenience was rectified " by the use of a mirror" (Report of Juries, Exhibition, 1851).

Camera lucida and camera obscura (*the light and dark chamber*) are names given "to two methods, very like in principle, of " throwing images of external objects upon a plane or curved " surface" (Pen. Cyc.). In the former there is no *chamber;* but as it was the last invented, and as its predecessor was called camera obscura, it was named camera lucida. The camera lucida is an invention of the late Dr. Wollaston; "it depends on the " phenomenon that when light is attempted to be thrown into a " rarer medium from a denser at more than a certain angle, " depending upon the two media, none will pass through, but " all will be reflected" (Pen. Cyc.). Dr. Wollaston took out Letters Patent for his invention on 4th December 1806, and an abridgment of the Specification will be found at page 17 of the present series.

Linear drawing.—Numerous as are the representations of mathematical *figures* on ancient papyri, &c., &c., we have no record of the early use of mathematical *instruments.* It would be somewhat presumptuous to assert that the compass may be recognised among the hieroglyphics, although a character consisting of two legs meeting in a point and forming an angle is common enough.

The compass, the invention of which is ascribed to Talus, the nephew of Daedalus, was well known to the Greeks and Romans, as the words διαβήτης and *circinus* are found in classical authors. Aristophanes for example uses the former word twice; Caesar in his Gallic war uses the latter once; Vitruvius and Pliny several times.

The ancients certainly did not possess such beautiful and accurate instruments as the moderns, on which account we must the more admire the ingenuity and patience whereby they overcame their architectural difficulties.

An account of some excellent mathematical drawing instruments and of some pantographs is given in the Reports of the Juries for the Exhibition of 1862.

Grounds. The ancients "painted on wood, clay, plaster, stone, "parchment, and canvas" (Dict. Antiq.). But few of the great painters of Greece painted on walls. According to Pliny (xxxv.) canvas was not used until the time of Nero; this may be doubtful although the inference is that canvas was of late introduction; there is no mention made of its being employed by the Greek painters of the best periods. Pliny notices as one of the extravagances of the time that Nero had a likeness of himself painted on canvas 120 feet high. In the same book he tells us that those only were held in esteem who painted *tabulae* (easel pictures); and in book xvi. that the wood used for panels was larch (larix femina). The panels were prepared by coating with chalk or white plaster, and when the painting was finished the panel was put into a frame and encased in the wall. "Wood however was frequently covered "(particularly in the earliest or Byzantine pictures) with parch-"ment, leather, or linen. Walls which were to receive paintings "of a finer description appear also to have been prepared with "cloth glued over the surface" (Gullick).

Vehicles used by the ancients were wax, resins, gums, glue or size, white of egg, milk, and water.

Varnishes.—"Every liquid or substance may be considered a "varnish, which when applied to the surface of a solid body "gives it a permanent lustre" (Gullick). As mummy wrappers were varnished, it is probable that varnishes composed of resins dissolved in oil were known in the most ancient times. It is not to be supposed that the Greeks were unacquainted with the mode of preparing varnishes; consequently the *atramentum* with which Pliny states that Apelles coated his pictures was most likely a peculiar varnish known only to the artist and kept secret by him. Pliny also informs us that a black indelible varnish prepared from jet was used on vases as a background, and that bronze statues were coated with a varnish made from bitumen. Fresco walls when painted were covered with an encaustic varnish.

The length which this introduction has already reached obliges us to pass by without remark arabesque, Byzantine art, colours, crayon or pastel drawing, driers, diptychs, triptychs, and polyptychs, embroidery, gilding, glazing, niello, painting on glass and pottery, perspective, photography, scene painting, statue painting, tarsia wórk, water-glass painting, an account of ancient paintings and of the decline and revival of the arts.

The English school of art.—Slow indeed was the progress that art had made in England at the epoch when the great continental schools had attained nearly to their meridian splendour. Even during the life of Leonardo da Vinci, Michel Angelo, Albert Durer, Titian, Raphael, and Corregio, from 1445 to 1576, we could boast of scarcely a native artist. "Foreigners were engaged "for every important work in painting; in fact foreign artists "were preferred even down to the time of Sir Joshua Reynolds, "from whose time the English school properly dates" (Gullick).

The names of the artists who executed the work in the Painted Chamber at Westminster in the reign of Henry III., and in St. Stephen's Chapel at Westminster in the reign of Edward III., are not known for certain. The sculptures in the west front of Wells Cathedral are believed on good authority to be the work of native artists during the 13th century. In St. Mary's Church, Warwick, there still stands a monument to Richard de Beauchamp, the workmanship (as regards the statues) of William Austen, an Englishman who lived in the reign of Henry VI. (1422–1461).

The zeal of the reformers and the puritans has deprived us of nearly every vestige of early English painting and sculpture; nevertheless there are still extant portraits of Richard II., Henry IV., Henry VI., Edward IV. and his Queen, Jane Shore, and Henry VII., although we are ignorant of the names of the artists.

With the reign of Henry VIII. (1509–1547) the first establishment of painting in England may be said to have taken place. He invited several great artists to England and purchased some of their works. “The reigns of Edward VI. and Mary were “ not favorable to the fine arts; but under Elizabeth the arts “ continued to make progress. James I. did not meddle with “ the arts, perhaps fortunately for them. Charles I. was the “ first English king whose example and encouragement created “ an era of real taste for the fine arts in Britain. He purchased “ a great number of valuable pictures and invited to his court “ Titian, Rubens, and Vandyke. Charles II. encouraged art “ but not good taste. James II. followed a similarly depressing “ course, preferring foreigners to natives. William III. was not “ an encourager of art, except in the case of two foreigners, “ Kneller and Vanbrugh, and the vicious style of each in his “ vocation, both in this and Queen Anne's reign, corrupted the “ arts so much that under George I. the fine arts appear to have “ reached their lowest ebb in Britain” (Taylor).

In the reign of George II. (1727–1760) a brighter morn dawned on the arts; many celebrated native artists flourished, and the immigration of foreigners was checked by their finding the market forestalled by Englishmen with whom they could not compete. In 1760 the “Incorporated Society of British Artists” was formed, and the productions of native artists were for the first time exhibited to the public in the great room belonging to the Society of Arts. It is from this era that the English school of painting can fairly be dated. The exhibition was held annually in a large room in Spring gardens until the establishment of the Royal Academy in 1768. “In this year George III. embodied the “ principal artists by his own authority under the sign manual “ by the style and title of ‘The Royal Academy of painting, “ sculpture, and architecture.’ George III. may justly therefore “ be styled ‘the Father of the fine arts in England.’ George IV. “ encouraged the acquisition of rare and valuable works of classic “ art. During his regency the Parthenon marbles were brought “ to England. In 1824 the National Gallery of pictures was “ begun by the purchase of the fine collection made by J. Julius “ Angerstein, Esqre. William IV. took great interest in the “ affairs of the Royal Academy, and the last public place that “ he visited was the opening of the new gallery of the Royal “ Academy in Trafalgar Square, May 1837” (Taylor).

The Society of British Artists in Suffolk Street was established in the early part of the reign of George IV., and its exhibitions have brought forward many artists of talent and of high reputation.

The following scanty list of native artists of note will help to prove the truth of the foregoing remarks on the English school:—

Austen (a metal founder) lived in the reign of Henry VI.
Hilliard, born 1547, died 1619.
Oliver, Isaac, pupil of Hilliard, born 1556, died 1617.
Oliver, Peter, son of Isaac Oliver, born 1601.

Hilliard, Isaac and Peter Oliver, were celebrated miniature painters. "It is a matter for some national gratulation that this "charming branch of the fine arts has always been successfully "practised in England; indeed we excelled in it long before we "obtained distinction in any other" (Gullick).

Stone, Nicholas (sculptor), born 1586, died 1647.
Inigo Jones, born 1573, died 1653.
Jameson, born 1586, died 1644.
Dobson, born 1610, died 1646.
Walker, died about 1660.
Hoskins, died 1664.
Cooper, born 1609, died 1672.
Gibson, *the dwarf*, born 1615, died 1690.
Barlow, born 1626, died 1702.
Riley, born 1646, died 1691.
Richardson, pupil of Riley, born 1665, died 1745.
Jervas, born 1675, died 1739.
Thornhill, born 1676, died 1734.
Hogarth, born 1697, died 1764.
Hudson, pupil of Richardson, born 1701, died 1779.
Ramsay, born 1713, died 1784.
Reynolds, pupil of Hudson, born 1723, died 1792.
Gainsborough, born 1727, died 1788.
Romney, born 1734, died 1802.
West, born 1738, died 1820.
Beechey, born 1753, died 1839.

To the above may be added the names of Graham and Hayward, who lived during the reigns or part of the reigns of Charles I. and Charles II.

ARTISTS' INSTRUMENTS AND MATERIALS.

A.D. 1618, February 16.—N° 7. (* *)

BAKER, Abraham.—To "make, worke, and compound a cer-
" teyne stuff called 'smault;' and the same so made, wrought,
" and compounded by him" "during the terme of one and thirty
" years," "to vtter, offer to sell, or sell to any pickture makers,
" lymmers, paynters, or other person or persons within this our
" realme of England, and other our dominions or any part, at
" reasonable rates and prices." "To bring by all lawfull and due
" wayes and meanes from any the partꝭ beyond the seas, all and
" all manner of saffer and potashes, and all and every or any other
" stuffe or stuffꝭ or other com̄odityes whatsoever, which are or
" shall be needful or necessary for the making, compounding, and
" perfecting of the said stuff called smault."

Grant of "all and every the smaulte that shall happen to bee
" forfeyted to vs, our heires or successors, for non-paymente
" of the customes, subsidies," &c.; "and all penaltyes and for-
" feitures which shall happen to growe unto us;" and "all and
" every som̄e and som̄es of money and other dutyes which shall,
" may, or ought to happen, come," &c. to the king during the above term of years arising from smaults, on condition of the payment of "the yearly rent or som̄e of twenty poundꝭ of lawfull
" money of England."

[Letters Patent, printed, 6*d*. No Drawings. See Webster's Reports, vol. 1, pages 9, 10, 11, and 12; Carpmael's Reports on Patent Cases, vol. 1, p. 14. No Specification enrolled.]

A.D. 1753, February 19.—N° 676. (* *)

SUXSPEACH, John.—An instrument called the "catholic-
" organon or universal sliding foot rule," consisting of a stock containing "an octagonal slide or telescope and two thin slides,
" each slide containing a brass tongue, that form a quadrant."

The instrument is said to be "of great use in the practice of " arithmetick, geometry, mensuration, gauging, trigonometry, " navigation, dialing, astronomy, and all the branches of the " mathematics."

A stock contains "an octagonal slide, in the inside of which is " a brass drawer containing part of a telescope, so contrived that " when the instrument is in the case, which case is to keep the " same clean, the end of the case having an object glass, the " same forms a compleat telescope," "and the end of this drawer " contains a plumet used in time of observation. On each side " of the instrument is a thin slide, each containing a brass tongue " that form a quadrant, in the use of which no regard is had to " the horizon, but the sun only. At one end of the octagonal " slide is a brass head containing two small slides or slips of " brass; in the midst of each is a piece of dark glass to be used " in taking an observation by the sun."

"The said instrument contains eighty-six lines, exclusive of " those on the quadrant and perpetual almanack." The said lines relate to :—Equal parts, circles, polygons, squares, cubes, the five platonic bodies, versed sines, tangents, sines, chords, surfaces, solid contents, spheres, cones, cylinders, parabolas, ellipses, spheroids, decimal divisions, the sun, the moon, the stars, longitude, " canons in astronomy," mensuration, weights, mechanical powers, algebra, trigonometry, chronological cycles, and the principles of dialing.

[Printed, *4d.* No Drawings. See Rolls Chapel Reports, 6th Report, p. 127.]

A.D. 1753, December 12.—N° 686. (* *)

HULLS, Jonathan, and BRADFORD, William.—" A new " machine or instrum^{t} for discovering and preventing frauds by " counterfeit gold, which gives the weight and shews the alloy of " that metal, as well in coin as in rings and all utensils made of " gold, with the quantity of adulteration in such coin, and other " things, which instrument may be easily carried in the pocket; " as also a new sliding rule, whereby the contents of all solids " and superficials are more easily found out, and readily cast up, " than by the common sliding rule; Astly's new sliding rule will " perform the same at one operation as will require two or three " on the sliding rules heretofore made."

"The sliding rule consists of a line of numbers markt A, also "two lines of numbers on a sliding piece markt B and C; to "these is added an additional piece of brass, the one side containing "a line of numbers inverted, markt D. The opposite side "contains a series of unequal divisions markt E. When this "line is applied to the line C, it solves rectangular plain triangles, "subservient to divers purposes, especially to carpenters and "builders, it shewing by the breadth of the building the lengths "of all hyps, valleys, or gutter pieces, ring pieces, and so forth, at "any pitch, not only in square building, but also in bevil roofs; "for example, set ninety on the line E, always to ten on the "line C; when the length of the hyp is required place ten on the "line C, to the proportion of the pitch on E, and against the half "breadth of any building on B; the length of the hip is found "upon A, and so per contra. In measuring unequal-sided solids by "the rule at one operation, the opposite side of the brass markt D "is to be turned to the line of numbers markt C; and as the "contents of most solids are found by multiplying the length, "breadth, and depth together, and dividing by a proper divisor "in order to find the content of it in the desired denomination, "whether inches, feet, ale or wine gallons, malt bushells, &c., &c., "first set unity on the brass markt D to the proper mark for the "division C, and there let it remain always for all propositions of "the same denominations as it was placed for; then place either "of the two number together on C and D, and ag^{t} the other on A; "you have the answer on B."

[Printed, 4*d*. No Drawings.]

A.D. 1764, March 31.—N° 809. (* *)

CUMMINGS, George.—"A composition to put on all sorts of "skins, paper, or linen, for the use of drawing or writing on with "pen and ink, or pencil, and rubbing clean off again, and to "form it into a memorandum book, distinguished by putting the "name of each day of the week on the top of each leaf of the "book, and for other uses and purposes." "Take either vellum, "parchment, very fine cloth, or paper, and stretch it in a frame "as tight as possible; then take twelve pounds of white lead "and pound it very fine; then add one-third part of the best "plaister of Paris and one-fourth part of the best stone lime; "well pound them, mix these well together, and grind them "very fine with water; then take a new glazed vessel and dissolve

" six or seven pounds of the best double size over a fire, and " mix the above ingredients in this till it is of such a consistence " as to lay on with a brush; then lay three or four layers on the " skin or cloth as smooth as possible, observing that the skin is " dry each time before a second layer is put on; then take the " best nut or linseed oyl, and to every pound of this oyl add " four ounces of the best white varnish, and mix them well " together; then put on three or four layers of this oyl thus " prepared, each time exposing it to the air till it is thorough dry. " This is for the white sort." Other colours may be produced by adding stone ochre, or orpiment or Dutch pink, vermilion, Prussian blue, ivory black, &c.

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 7, p. 231.]

A.D. 1771, March 23.—N° 985. (* *)

ECKHARDT, ANTHONY GEORGE.—" A new rolling parallel " ruler, either with or without scales, sliding pen, and pencil, for " the purposes of drawing and dividing."

In its simple form this parallel ruler consists of a " flat ruler " or scale " having a perforated moulding " through the centre " thereof in the whole length " in which a steel axis is placed, its mountings being screwed to the ruler; at each end a similarly sized wheel is fixed " for the scale to roll freely upon."

In a second form the two wheels and the feathered edges of the ruler are graduated in inches and parts; indexes are attached to the ruler " to determine the distance of the parallel lines."

The above-described rulers, and those only, " are capable of " being constructed with a rolling cylinder " instead of " a moulding and axis." In this case a cavity is made in the scale, so that the cylinder may be introduced in the centre thereof.

In a third ruler " for drawing and dividing both parallel lines " and perpendiculars, as well as determining their respective distances," " the two graduated feathered edges " " are to be made " of brass for the convenience of fixing thereon a sliding pen, " pencil, and point, with their sliding spring."

In a fourth ruler " for drawing and dividing parallel lines, " perpendiculars, and circles, and for determining angles of all " degrees," " a moving circular graduated plate in the centre " is added. This circular plate receives its motion from a pinion " fixed in the axis that runs through the centre of the ruler, and " playing in the teeth of a cantered wheel," " being the under

" part of the circular plate;" "and to this is further added" " two folding brass arms" "to serve as a centre occasionally to " produce circles by means of this rule." To reduce geometrical drawings to perspective, a larger or smaller wheel may be placed in lieu of one of the two rolling wheels of the instrument.

Other details and possible modifications are mentioned.

[Printed, 10*d*. Drawing.]

A.D. 1775, June 24.—N° 1100.

HARRINGTON, Sarah.—"A new and curious method of " taking and reducing shadows, with appendages and apparatus " never before known or used in the above art, for the purpose of " taking likenesses, furniture, and decorations, either the internal " or external part of rooms, buildings, &c., in miniature." The person whose likeness is to be taken is placed so "as to procure " his or her shadow to the best advantge, either by the rays of " the sun received through an aperture into a darkened room " or by illuminating the room." The face is then brought " directly opposite the light, so that the shadow may be reflected " through a glass (or transparent paper);" the glass is moveable in a frame "so as to fix it on a level direction with the head of " the person." The outline of the shadow is then traced with a pencil, &c., after which it is "reduced to a miniature size by an " instrument called a pentagrapher."

Respecting furniture &c., "the articles required to be taken " are to be placed in such a direction that their shadows may be " reflected as above described, traced out in the same manner " and reduced." The shadows (as also the likenesses) are cut out "and placed upon black or other coloured paper or any dark " body," and the external parts are, if required, decorated with cut paper, &c.

"When a likeness is to be taken, accompanied with the external " part of a room or buildings," a camera obscura is used; the reflected shadows are received on paper, the outlines are carefully marked, and then "either fill'd up with Indian ink or colored, " or cut out as above directed."

[Printed, 4*d*. No Drawings.]

A.D. 1777, June 9.—N° 1156. (* *)

FISHER, Joseph.—"Universal machine lines for writing or " drawing." The principal parts of this machine are, 1, a frame having the right side grooved or slotted; 2, "three rulers which "are made to move parallel," by means of two pairs of arms mounted on six centres, two on each ruler; 3, two sets of lazytongs fastened to the ends of the upper and lower rulers; 4, lines "of fine thin silk," secured to the middle joints of the tongs. A brass plate, carrying a knob and pinned to the right end of the upper ruler, slides in the groove or slot; by moving the knob down or up "all the lines extend or contract in a parallel direction." In inferior machines, the tongs are omitted, and the lines are fixed to the arms. "A board or plate covered with "white paper is fixed between the rulers and lines, over which is "placed the paper for writing on. The geometrical squares for "drawing are made to extend or contract by placing four pieces "of machinery" made to move with lazytongs, one set "at each "side of a square frame or drawing board;" the lines are fixed and moved as before described.

[Printed, 6*d*. Drawing. See Rolls Chapel Reports, 6th Report, p. 163.]

A.D. 1778, March 4.—N° 1183.

STORER, William.—"An optical instrument called an accurate "delineator," "for drawing the human face, inside of rooms, "buildings, perspectives, landscapes, foliage, and fibres of trees "and flowers." This instrument "may be made of various "forms," and the effects produced by it, either by the light of the sun or moon, or by any other light, "arise from a new-invented "application of lenses, mirrors, speculums, prisms, or mediums "of lenses of glass, or any composition containing reflecting or "refracting powers." The rays from the object "are at first "received on or conveyed to a mirror or speculum placed at a "proper angle in the inside of a tube or box by one or more "convex lens or medium of lenses before the mirror or speculum." Where the object "is conveyed thro' a lens or medium of lenses "on the mirror or speculum, one or more convex lenses or "medium of lenses must be applied to correct and illuminate "the rays, and to receive from the mirror or speculum the rays "conveyed thereon through the first-mentioned lens or medium "of lenses;" but where the rays from the object "are received "in the first place on the mirror or speculum, a convex lens or "medium of lenses must be placed, fixed, or moveable, next after "the mirror or speculum to collect the rays" therefrom; and at a proper distance from the first lens "must be applied one or " more convex lens or medium of lenses to correct and illuminate " the rays from the first lens." By such means all rays " that " are spherically refracted through the first medium will be " made parallel," and all objects will be " accurately represented, " and all parts thereof equally illuminated on the lens or medium " lenses so receiving and correcting the rays of the objects " received from the mirror or speculum or first lens or medium " of lenses."

"A prism, mirror, or speculum, placed at a proper angle to " reflect the image on the first lens or medium of lenses, mirror, " or speculum, the objects will be represented in their true shape, " figure, and form; and a collecting or correcting lens or lenses " or medium of lenses to collect or correct the rays from the " images presented by a reflecting microscope, magick lanthorn, " camera obscura, or other instrument of the like nature, instantly " forms the accurate delineator."

[Printed, 4*d.* No Drawings. See Repertory of Arts, vol. 4, p. 239; Mechanics' Magazine, vol. 43, p. 93.]

A.D. 1780, December 16.—N° 1274. (* *)

BECK, GEORGE.—"A complete apparatus for surveying and " planning in general by land and sea."

1st. "A portable horizon, consisting of a polished polygon, " having each of its polished planes suspended perpendicularly."

2nd. A " goniameter or instrument for taking angles."—On the centre of the instrument are two mirrors, one fixed and the other attached to the index, and in the same plane as the fixed mirror when the index is at 0°. A sight near the limb is used for taking observations by one reflection only. Another sight, near the centre, is used when observations are made by double reflection by means of a horizon glass on the middle bar of the instrument. Inclined mirrors, " moving on an axis at right angles to the axis " of vision," " reduce objects to the same horizontal plane," to ascertain horizontal angles.

3rd. A " sectoral protractor."—Two legs work upon a centre and a " traverse " works upon another centre. The edges of the legs are divided to solve trigonometrical problems. A ruler is also used to stretch a fine thread in " protracting stasimetric " surveys."

4th. "The selnographer."—This instrument reduces or enlarges plans, by means of a tube revolving on a centre and carrying the tracing and marking points.

5th. "The catoptric plane table."—"A joint rule" carries two mirrors, one upon each leg near the joint; pins are fixed at the extremities of the legs, and angles are taken by means of their images in the mirrors. Additions and a modification are also set forth.

6th. "The universal sliding scale." This has "all the lines "usually put on scales" "laid quite round the sides and rounded "ends;" "by means of bands carrying indexes" each line has "all the properties of circles of proportion."

[Printed, 6*d*. Drawing. See Rolls Chapel Reports, 6th Report, p. 165.]

A.D. 1781, January 24.—N° 1277. (* *)

ANGELL, ALBERT.—"Britannick elastick gum, very serviceable "and useful in the several branches of portrait and house painting, "by making the colours durable and free from peeling; also of "great utility in guilding, painting, pencilling, and staining of "silks, calicoes, &c., and in dressing of silks, linen, and cotton in "the loom, instead of gum or paste, so as to strengthen the "threads of the finest cottons; and is also excellent for beautifying and fixing the colours upon paper, equal to that done "in India; and is of the greatest use for the rendering the clay "or composition used in modelling supple, and preventing the "same from drying too fast, and for causing a transparency of "colours fit for china and earthenware, so as to stand baking or "burning." This elastic gum is compounded of "linseed oil or "nut oyl one gallon, bees' wax, yellow or bletch't, one pound, glue "or size six pounds, verdegrease a quarter of a pound, letteridge "a quarter of a pound, spring or rain water two quarts; to be "put into an iron kettle and melted down till it comes to the "composition."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 3, p. 381.]

A.D. 1781, February 26.—N° 1281. (* *)

TURNER, JAMES.—"A method of producing a yellow colour for "painting in oyl or water, making white lead, and of separating "the mineral alkali from common salt, all to be performed in "one single process, which would be of great publick utility."

Lead is calcined "or minium, or red lead, or litharge," or "any "preparation of lead fit for the purpose" is mixed with half its weight of sea salt or such like salt dissolved in "a sufficient quan-"tity of water," and triturated together; after twenty-four hours "the lead will be changed to a good white, and the salt decom-"pounded; if not the trituration must be repeated with the "further addition of salt, till the white colour be obtained. The "decomposition of the salt may also be brought about by diges-"tion or by calcination." The alkali is separated by water. "The yellow colour is produced by calcining the lead," and is "of different tints according to the continuance of the calcination, "or the degree of heat employed."

[Printed 4*d*. No Drawings. Repertory of Arts, vol. 12, p. 157; Engineers' and Mechanics' Encyclopædia, vol. 2, p. 59; Webster's Reports, vol. 1, pp. 77 and 84; Webster's Patent Law, pp. 45, 87, and 115 (also page 126, case 21); Carpmael's Reports on Patent Cases, vol. 1, p. 105; Davis on Patents, p. 145; Collier's Law of Patents, pages 101 and 132; Billing on Patents, pages 97 and 99; Parliamentary Report, 1829 (*Patent Law*) p. 186; Durnford and East's Term Reports, vol. 1, p. 602; Patentee's Manual, p. 85; Rolls Chapel Reports, 6th Report, p. 141.]

A.D. 1781, July 28.—N° 1301. (* *)

BECKWITH, THOMAS.—"Making crayons for drawing and "other purposes of various colours, superior to any heretofore "made." The compound, which "is to be put into grooves of "wood, and formed into crayons or pencils," is made of "colours "prepared from the purest mineral, animal, and vegetable pro-"ductions." With such colours as require it, is mixed "a pro-"portionable quantity of the most pure impalpable mineral calx, "or the choicest terrestrial fossil substance," adding thereto "due proportions of well dephlegmated essential oils, and of "animal oleaceous substances, so as to render the mass or com-"pound of a smooth and uniform texture, and yet more so by "the means of mollification, inspissation, and exsiccation by "fire."

[Printed, 4*d*. No Drawings. See Rolls Chapel Reports, 6th Report, p. 166.]

A.D. 1786, December 19.—N° 1578.

HENDERSON, THOMAS.—An apparatus by which "every "visible object may be drawn and taken to any size, on true "mathematical principles, with great accuracy and facility." The apparatus consists of (1), a box provided with a frame which is fastened to it by hinges and with a supporter "which falls into

" a notch and raises it to a convenient inclination;" (2), an upright piece that "fastens in a mortice by a screw at the left-" hand end of the box when used in drawing;" (3), a top piece that screws into the upright in front of the box; (4), an arch supported at a right angle on a cylinder which fits into the top piece, "with a screw to keep it in its place, but sc as to let it " have an easy movement;" (5), a tube in which the point of sight is raised or depressed by means of a small wheel moving on the arch; (6), a "conductor with a small aperture which " directs to the point of sight;" (7), a pencil case and pencil; (8), a joint, a support of the arch, a stay to the tube, a support for the pencil case, and a screw "by which the metal part of the " instrument may be taken to pieces for the purpose of being put " in the box."

Directions for use:—Set the box level on a stool or table; put the upright into the mortise and screw it tight; screw on the top piece; "take the metal part of the instrument, which is in two " pieces," and "after screwing the same together fix it into the " top piece;" take hold of the pencil "and look with one eye " through the aperture to the directing or tracing point," which rises or declines upon the arch "according to the different parts " of the plane you draw upon, and according as the point of " sight is moved to different parts of the object."

[Printed, 6*d*. Drawing. See Rolls Chapel Reports, 6th Report, p. 177.]

A.D. 1787, June 19.—N° 1612.

BARKER, Robert.—"An entire new contrivance or apparatus, " which I call la nature à coup d'oeil, for the purpose of dis" playing views of nature at large by oil painting, fresco, water " colours, crayons, or any other mode of painting or drawing." This invention is intended "by drawing and painting, and a proper " disposition of the whole, to perfect an entire view of any country " or situation as it appears to an observer turning quite round." The artist is to "delineate correctly and connectedly every object " which presents itself to his view as he turns round, concluding " his drawing by a connection with where he began." There must be "a circular building or framing erected on which this " drawing or painting may be performed; or the same may be " done on canvas or other materials, and fixed or suspended" on the building or framing. It must be lighted entirely from the

top, and there must be an inclosure within it, "which shall pre-
" vent an observer going too near the drawing or painting;" the inclosure may be of any form, but a circular form is particularly recommended. "There must be over it, supported from the " bottom or suspended from the top, a shade or roof, which in " all directions should project so far beyond this inclosure as to " prevent an observer seeing above " the picture, and outside of it " another interception to represent a wall, paling," &c., so as effectually to prevent the observer from seeing below the bottom of the picture. The entrance to the inner inclosure must be from below; "the inner inclosure may be elevated at the will of an " artist;" and ventilators should be fixed below the picture " so " as to render a current circulation of air through the whole."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 4, p. 165; Rolls Chapel Reports, 6th Report, p. 176.]

A.D. 1790, August 21.—N° 1774. (* *)

PHIPPS, JOHN.—" A method to facilitate the acquirement of " several of the useful and polite arts by an easy, effectual, and " expeditious manner of teaching writing and drawing, which is " done by constructing or fabricating the molds, wove or washing " wires, or other wire in or on which paper is made, so that every " sheet shall come out of or from them properly adapted for the " purposes, when finished by the maker in the usual manner, by " having the lines made and the copies set for writing, and the " outlines and sketch for drawing, by what is called the water- " mark, for the learner to trace over:" and this is to be effected by causing the paper to receive from the moulds an "impression " or delineation for the learner to trace over."

[Printed, 4*d*. No Drawings.]

A.D. 1796, November 19.—N° 2147. (* *)

COBB, THOMAS.—" A method of making coloured paper supe- " rior for brightness and richness of colour, to any made by any " other person, and which paper when made after the manner " invented by me, may be used as well for the purpose of hanging " rooms, as for writing, printing, drawing, and various other " purposes of paper." " When the rags or other materials are " sufficiently washed by means of the paper engine, made white, " and reduced to half stuff in the usual manner for beating, I " drain off the water and convey the half stuff intended to be

" coloured into the vessel or vessels in which it is to be dyed,
" where I subject it to the processes commonly used in dying
" of linen, cotton, silk, or wool, according to the materials of
" which the half stuff is composed. I only vary by preparing
" separately from the usual materials for dyeing a clear decoction
" or infusion of the dyeing materials (for producing bright and
" rich colours, viz., scarlet, yellow, green, pink, mazarine and
" China blue), which, previous to the half stuff being immersed
" therein, are strained, filtered, or allowed time to deposit their
" grosser parts. In cases where heat must necessarily be applied
" during the dyeing of the half stuff, which are well known to
" dyers, I use false bottoms to the vessel or vessels in which it is
" to be dyed, which false bottoms prevent the half stuff from
" touching the bottom of the vessel, and thereby being injured
" by the fire, and should be pierced with small holes to admit the
" circulation of the decoctions or infusions in the vessel. When
" the half stuff is sufficiently coloured, I remove it from the
" dyeing vessels, and return it to the engine; and after having
" washed it for a short time in those cases which require it, in
" order to brighten the colours, and which are well known to
" dyers, I beat it by the paper engine as usual into pulp or stuff
" for the vat, after which it is made into paper in the usual
" manner. In such colours as are dyed cold, the decoctions or
" infusions may be mixed with the half stuff whilst in the engine
" itself, or it may be dyed in a separate vessel."

[Printed, 4*d*. No Drawings. See Rolls Chapel Reports, 6th Report, p. 191.]

A.D. 1799, April 11.—N° 2305. (* *)

BRUNELL, Marc Isambard.—" A certain new and useful
" writing and drawing machine, by which two or more writings
" or drawings, resembling each other, may be made by the same
" person at the same time."

A machine "for making two writings or drawings by the same " person at the same time," consists of a sliding board which is carried by "a desk with folding hinges," and which receives the surfaces to be written or drawn upon, and supports the upper machinery that communicates the motion of the pen in the writer's hand to that which makes the duplicate writing. The upper machinery is supported by means of uprights, and consists of an oblong horizontal transverse frame fixed thereto, with which is connected an upper frame (at right angles to the said oblong frame); the upper frame (called "the autograph") has its length at right angles to the oblong frame, and can move along the said oblong frame parallel to the writing by means of traversing wheels; the said upper frame carries an oblong interior frame, as well as centres and beams that connect the pendulous pens and their adjustments. The interior frame vibrates on its longest axis by means of centres in the exterior frame, and carries the centres whereon the two metal "beams" from which the pens hang are free to vibrate; the inner ends of the beams are connected together by a pin and slots. A rod extends from one penholder to the other. These arrangements, in connection with minor adjustments, enable the second pen to copy the motion of that in the writer's hand.

An extension of the rod from the penholder, and an additional rod parallel thereto, communicate motion to other pens if required.

Folding and other modifications of the instrument are set forth.

[Printed, 10*d*. Drawing. See Repertory of Arts, vol. 13, p. 153; and Rolls Chapel Reports, 6th Report, p. 195.]

A.D. 1801, June 2.—N° 2510.

GUEST, Thomas Robert.—" Boxes of a new and improved " construction, of various forms and sizes, to contain certain new " and improved materials and other necessary articles for drawing " and painting; likewise an entire new and improved method of " arranging on scientific principles the colours to be contained " in the said boxes." The boxes are to be so shaped as to contain a round, oval, square, or other piece of marble, wood, metal, porcelain, or other proper material, which is to be called a palette of colours; this " will be sometimes fitted in the top or cover, or " in a drawer either in the front, end, or side, or some other con- " venient place," so that it may be readily removed. The palette, of whatever material it be made, " should be presented in an " unglazed or unpolished state," and the colours are to be fixed on or let into it by making or sinking them in suitably shaped places to receive them. The colours are to be fixed " by first " caking them" and afterwards " fastening them in while damp" with some mucilaginous mixture. Thus " the artist has no occa- " sion to apply to a plate or other material to rub his colours on," the palette serving for that purpose.

The colours are to be arranged in the following order :—" The " three original colours, yellow, red, and blue," are to be fixed so " as to shew their intermediate shades," and " every possible tone " or tint that can be presented to the eye;" these are to be indicated by " the numbers 1, 2, 3, &c." and " may be called " yellow, orange, red, purple, blue, green, and brown, etc."

In the larger boxes the colours " will likewise be divided into " transparent or glazing and opaque or body colours," the former on one side of the palette, the latter on the other, and each " arranged in the same manner with regard to the degrees of tone " and situation."

In boxes " capable of containing them " there will be added " the necessary varnishes with directions for their use," a palette knife " formed out of shell, or ivory, or horn, or wood," camel, fitch, and sable pencils, new pencils of cork, pumice stone, sponge, port-crayons, pencil-racks, water-glasses, and parallel rulers.

" For the army and navy " pocket boxes are made, containing some only the three original colours, others the three with the addition of brown and black, " with room for the pencils and " cards."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 15, p. 161.]

A.D. 1802, January 26.—Nº 2575.

DE PHILIPSTHAL, Paul.—Apparatus to " represent in a dark " space or scene the human figures, various characters, proportions, and sizes, and by which means painters and other artists " may accurately enlarge or diminish any painting with more " certainty and facility than has hitherto been known or done." The specification describes only methods " by means of optical " experiments to produce numerous representations of ghostly " apparitions."

1. " The apparatus of some of these exhibitions consists of two " concave glasses, or rather two concave metal reflectors, before " which an artificial light proportionable to their focus is applied;" these " are secured in a closet or box proportionable to their size " and their requisite light, in such a manner that all the rays of " light are directed upon a transparent picture," which " reflects, " by means of some lenses, upon a transparent body, and giving " the necessary direction to this apparatus," in such a manner " that the apparitions represent themselves to the eye of the

"spectator arbitrarily." Similarly landscapes and buildings may be exhibited "in a very striking and deceiving manner in a "voluntary size."

Other apparitions "are produced by the refraction of light, by "means of transparent bodies of various shapes and sizes, which "are fixed in a dark closet as aforesaid, and by means of the "refraction of an artificial light are either made visible or "invisible."

A third set of "optical deceptions" is produced "by opaque "moveable figures of various shapes and sizes; these are "moderately enlightened by the refraction of a concave metal "reflector fixed in a dark closet, but the rays of light must be "properly distributed by the refraction of a lens of a propor-"tionable focus, in order that the enlightened object may alone "represent itself to the eye."

A fourth sort is shown in the following manner:—"There is "between the transparent body, upon which the figures reflect, "another dark body slipped in, upon which a fixed number of "figures are applied and are distributed in a symmetrical manner; "upon these figures either a greater or less light is directed "according to the disposition of the groups, and gives to the "apparatus the necessary direction, in order that those which "reflect upon the transparent bodies may move through one "another and form all manner of groups."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 16, p. 303.]

A.D. 1803, September 24.—N° 2735.

HAWKINS, John Isaac.—"New machinery and methods for "writing, painting, drawing, ruling lines, and other things, "and for applying parts of the aforesaid machinery to other "purposes." In this specification are described (1) a manifold writer, which can be used for ruling as many lines at once as there are pens, also for painting or drawing "two or more "pieces at the same time resembling each other," for taking and multiplying likenesses (all of the same size), and for taking "likenesses in perspective of various sizes at the same time;" (2) a machine for taking copies of the original (at the same time as the original is executed) of different sizes; (3) a pocket memorandum apparatus, on which a person may write in the dark "without any fear of writing two lines on one place."

1. The essentials are “a horizontal and perpendicular parallel “ruler” or frame and a “suspending frame;” these for writing and ruling are fitted to a desk, for painting or drawing to an easel, “the horizontal parallel ruler becoming the perpendicular, “and vice versa.” The outer end bar of both horizontal and perpendicular portions moves on pivots which work in studs; the former is thus fixed to the desk (for writing), the latter to the upper part of the suspending frame. The studs in which the pivots of the inner bar of the horizontal portion and those in which the pivots of the lower bar of the perpendicular portion work, are made fast to a cross bar. Through this cross bar pass bent arms, “turning on their axis” and having attached to each by means of sockets a pen, camel's hair pencil, or port-crayon. For taking likenesses a tracer is fixed (on a principle described) “to one or more parallel rulers,” and “also as many pens, pencils, “or metal points” as it is intended “to multiply likenesses.” For writing there are as many inkholders as pens so placed that each pen may dip at the same time, and for painting palettes “with as many chambers in them as colours may be wanted,” and with a level surface between each chamber “to touch the “pencil on and equalize the colour.”

2. “This machine consists of two pantographs, whose planes “and the plane of the desk or table whereon the machine acts “coincide at their fulcra, and from thence diverge at an angle “of from five to ten degrees each plane from the other.” Separating bars are united to the pantographs by universal joints, “whose centres are in the centres of the joints of the pantographs “as well as in their planes; from them proceed arms carrying “sockets, and little wheels and springs support the weight of the “apparatus.”

Full directions are given for making each machine and for its application to the before-mentioned purposes; modifications of certain parts and the method of holding the paper or other material are described, and three forms of the tracer with the mode of fixing it are added.

[Printed, 1*s*. Drawing. See Repertory of Arts, vol. 4 (*second series*), p. 327.]

A.D. 1804, December 19.—N° 2797. (* *)

PASQUIER STEPHEN.—“A new manufacture, system, or “method of writing, printing, engraving, drawing, painting, “stamping, working, and using certain characters, figures, instru-

" ments, and machines for facilitating correspondence and other " literary operations." The description given in the specification relates almost entirely to a mode of correspondence called by the patentee "cryptography." Each alphabet is arranged "within " four horizontal and two perpendicular lines," forming three squares; in each square are nine letters arranged in a certain order; sometimes six horizontal lines are used. If the alphabet of any language has not so many letters, the vacant places are filled up with a repetition of such as "are thought to be more " frequently used;" if more, they are added at top and bottom or at one side. Each party must be possessed of a copy or be well acquainted with the particular place occupied by each letter in each square. The patentee gives drawings of a great variety of figures intermingled one with another; every line, straight or curved, "running rather downwards than horizontally," is to be considered as perpendicular; every one from right to left, as horizontal. The writer selects one of these combined figures and makes dots thereon; each dot represents a letter and is put on a spot in one of the figures corresponding to the spot which it occupies in the key, each figure or part of a figure being reckoned as three squares. Another key is filled with numbers, and directions are given for its use.

The patentee briefly describes a machine "which may be of use " to the deaf and dumb for conversation;" it is composed of " cylinders moving the symbols," keys or springs acting on the cylinders, and an elevated part whereon the symbols are exhibited.

He describes also a "writing, reading, and tracing desk;" the frame is hinged, the upper portion being kept at an inclination by a support and a rack. A circular frame, in which is a plate of glass, turns round in the upper portion by the aid of two notches; it is secured by four bolts. A brass rim, fixed with four spring pins, keeps " anything laid over the glass in its place."

[Printed, 3*s.* 6*d.* Drawings.]

A.D. 1806, December 4.—N° 2993.

WOLLASTON, William Hyde.—"An instrument whereby " any person may draw in perspective, or may copy or reduce any " print or drawing." The instrument consists principally of two reflectors " with the necessary framing, which every competent " workman may easily make." The reflectors are inclined to each other at an angle of 45°; the one is to be " wholly or in part

" interposed between the eye of the artist and the paper or other " material" on which the drawing is to be made; the use of the other is that objects reflected by it " may also be again reflected " by the first, and may by that means be rendered visible to the " eye after two reflections, when the sight is directed towards " the said paper or other material." If the object be " con- " siderably luminous," the first named reflector " may be a piece " of plain and unsilvered glass;" if the object be " less bright," glass of a blue or any other dark colour will be preferable, but it is better to employ " a glass partly silvered, and to allow the " paper to be seen through an opening in the silvering or past " the edges of the same by one portion of the eye, while the " doubly reflected object is seen in the silvering by the other " portion of the same eye."

" When prismatic reflection is employed," the angle of the reflectors must be 135°, but the patentee does not prefer surfaces of such description. For short-sighted persons he places " a " suitable concave glass before the distant object so as to receive " and transmit the incident rays," and for long-sighted persons " a suitable convex glass " between the eye and the paper.

In the sheet of drawings annexed to the specification is a section of a pair of reflectors mounted in a frame which carries one convex and one concave glass; these " turn upon the same " hinge," so that either of them " may be turned into its place " for use." These glasses " may conveniently be made of the " focal length of twelve inches, and the instrument must then be " supported at the distance of twelve inches from the paper."

[Printed, 6d. Drawing. See Repertory of Arts, vol. 10 (*second series*), p. 161; Rolls Chapel Reports, 7th Report, p. 103.]

A.D. 1806, December 22.—N° 3000.

SCHMALCALDER, Charles.—" A delineator, copier, pro- " portionometer, for the use of taking, tracing, and cutting out " profiles, as also copying and tracing reversely upon copper, " brass, hard wood, cardpaper, paper, asses skin, ivory, and glass, " to different proportions, directly from nature, landscapes, pro- " spects, or any object standing or previously placed perpen- " dicularly, as also pictures, drawings, prints, plans, caricatures, " and public characters." This apparatus is composed of (1) a hollow rod " screw'd together, and from two to twelve feet, or " still longer, chiefly made of copper or brass, sometimes wood, or

" any metal applicable;" the diameter is from half an inch to two inches and upwards, according to the length; one end carries a fine steel tracer, made to slide out and in and fastened by a milled-head screw, and in the other is "a round hole to take up " either a steel point, blacklead pencil, or any other metallic " point, which may be fastened therein by a mill'd-head screw;" (2) a tube about ten inches long and sufficient in diameter to allow the rod "to slide easily and without shake in it;" (3) a ball (in which the tube is fixed) " moveable between two half sockets;" (4) a frame of wood about two and a half or three feet long (the length depending on the length of the rod) and supported by two brackets; (5) a swing-board attached to the frame; (6) a clamp-screw; (7) a hook hanging on a string for the rod to rest in; (8) a weight on the back of the frame, connected thereto by a hook " to which is attached a string forming a pulley, serving to prevent the point from acting upon the paper when not wanted." Through the sides of the frame are holes at certain distances corresponding with marks on the rod, and "in copying any original, " supposing to the size of ⅛, ¼, ½, ¾, &c." the swing-board and clamp-screw "must be transplanted to the different holes and " divisions corresponding." The paper or other substance is fastened to the swing-board by screws or is placed in a brass frame which slides up and down the board, and is kept in position by a spring. "The machine is fixed either to a partition in any " room or to any piece of wood portable, and so constructed as " to be easily fixed upright with a screw-clamp upon a table or " any other stand." In turning the rod round in the sockets " the tracer and point in the two ends of the rod must remain in " the centre, to obtain which sometimes an adjustment with four " screws " is required.

Directions are given for using the apparatus in taking profiles, in copying and tracing pictures, landscapes, &c., and in copying from nature "landscapes or whatever object exposes itself to " view."

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 10 (*second series*), p. 241; Rolls Chapel Reports, 7th Report, p. 195.]

A.D. 1807, July 28.—N° 3064.

PHILLIPS, JOHN.—" A method or methods of constructing and " removing offices, counting-houses, and other rooms, with desks, " drawing boards, and other similar conveniences; which method " or methods may also be applied in the construction and remov-

" ing of bridges, cottages, sentry-boxes, and other purposes, and " erections of a smaller or larger extent." The patentee describes inter alia (1) a desk convertible into a painter's easel, (2) a drawing board, and (3) a drawing square.

1. The principal parts are a pedestal, a shaft sliding in a groove in the pedestal, a round piece of wood hinged to the top of the shaft, and a flat surface "confined by a bolt and wedge or key" to the round piece. The sliding is aided by a lead weight fastened to the shaft by a sash line or chain, and moving in another groove in the pedestal. To the round piece is secured a semicircular rack which is worked by a pinion wheel. To prevent papers from sliding off when writing, &c., screws "turn up into a " slip of wood on the edge" of the surface. To use the desk as an easel, a hook is fixed at each end of the surface, and a piece of wood is placed across "to keep the picture up." The patentee describes a modification in the method of fixing the top portion.

2. A piece of mahogany or other wood is divided into as many parts as may be considered necessary. The patentee then glues on at the corners a piece of the same kind of wood, rabbeted all round; he then joins two pieces at the corners by a mortise and tenons and rabbets them "on the under edge to fit on the edges " of the first piece." He next rabbets "the two outside edges " on top, and so on for all the divisions," and then "across all " the ends in the same manner." A frame for the outside is rabbeted "in the bottom inside edge," and the divisions are confined "by having pieces of brass, &c. fixed on to the edges " thereof." A similar piece carrying a ring is "fixed to the " bottom board."

3. The square is made of metal or hard wood, "each end and " side of equal thickness." At one corner is fixed a graduated quadrant, whereto is riveted or screwed a thin piece of metal or wood for drawing "bevel lines." This piece is held in position by a milled screw, and when not wanted is confined by a hook at one corner of the square. In one side of the square is a hole for a thread or line, and opposite on the quadrant a mark or line, so that the instrument can be used as a level or a plumb-rule.

[Printed, 10*d*. Drawing. See Rolls Chapel Report, 7th Report, p. 190.]

A.D. 1807, October 21.—N° 3076. (* *)

CARON, Louis.—" Certain new methods for weaving or manu" facturing hair along with silk, thread, or other materials, and

" of making the same into perukes or wigs and various other " articles so as to imitate nature, and of taking the measure or " section or profile of the head by an instrument applicable to " that and other useful purposes."

" The instrument for taking the measure, profile, or section of " the head consists of a flat box containing a double brass frame " in which one hundred and ninety-seven apertures are made, " through which are made to pass a like number of parallel steel " wires placed close to each other and in such manner as that " upon holding the box with the apertures downwards, the wires " will to a certain extent and to an even length be projected " therefrom in that direction preserving their parallelism to each " other. The box should then be raised so as to apply the wire " to the head of the person or other object, the shape and dimen-" sions of which is intended to be taken by the pressure of which " against the wires they will be made severally to recede into the " box, so as to describe along their points the projections and " outlines of the object and by means of a screw the wires are " fixed in and made to retain their position from which the " dimensions are delineated on paper by a pencil or crayon; the " dimensions of the different parts of the head are thus taken in " divisions by the union of which, the size, shape, and measure-" ment of the whole is obtained."

[Printed, 4*d*. No Drawings.]

A.D. 1808, February 22.—N° 3110. (* *)

WEDGWOOD, Ralph.—" An apparatus for producing several " original writings or drawings at one and the same time which I " call a Pennœpolygraph or pen and stylographic manifold " writer." This invention " consists in so disposing of two or " more sheets of paper or other writing materials so that they " may be written upon at once with double-pointed pens," or with " two pens or styles so combined as to be held in the hand " as a pen is commonly held." " If it be required that both the " papers to be written upon should be in the usual fcrm," they are connected by machinery; if the usual form of one of them can be dispensed with, " linear copying paper " is used, which consists of a sheet of paper with alternate spaces cut out, so that " when it is laid on a sheet of writing paper, one point of the double pen may be on a space of the linear, and the other on the sheet underneath.

The pens are combined by being fitted into "a double spring " socket," and are kept "in a parallel situation" by a pin in each socket, sliding in a groove in each penholder. Or the sockets may be made separate and kept together by "two sliding clasps," one of which "is soldered to the lower socket;" the distance between the pens is regulated by a screw.

The pennœpolygraph consists exteriorly of an oblong case and lid in which two frames on wheels run one into the other. Each frame has a rack, that of the inner passing above and that of the outer below a toothed wheel turning on a spindle which lies across the middle of the oblong case. The spindle and the toothed wheel are turned by a "handle or mill head" outside the case. One leaf of paper is stretched over the inner frame; one edge of another leaf is held by a clamp fitting on to the outer frame; the leaf then passes under a bar at the inner end of the frame, is doubled over it, and lies the length of the frame. When brought into position one line may be written on each paper simultaneously with the double pen; the handle of the spindle being then turned will cause the line on the upper leaf to disappear under the bar, and that on the lower leaf to move from the writer in front.

Another machine has two wedge-like straining boards, at the thick end of each of which is a roller turned by a key. The papers or parchments are made each cylindrical by being united at the ends; they are then put over the straining boards and kept stretched by "2 weights in the form of rollers" hanging in the loose part below. These two boards with their narrow ends together are placed in a stand, so that the upper surfaces of the paper are in the same plane; outside the stand pulleys connected by a string are attached to each roller. After a line has been written on each paper, by turning the key in either roller, both cylinders of paper revolving in the same direction will present fresh space for writing. "To keep the lines at any " given distance, if desired, wheels and spring catches may be " annexed to one of the pulleys."

A pocket apparatus is made as follows: — It has only one straining board; the roller, toothed at one end, is attached to a separate frame which moves in a groove on each side of the straining board; the roller and frame are slided in and out for the purpose of tightening the cylinder of paper by a spindle with toothed wheels working in racks in the grooves; the second paper is attached its whole length to a bar of thin metal, to which a rack is fastened; underneath the roller a pinion-wheel works in its toothed end, and at the same time works in the rack on the bar, and so turns both papers together.

An inkstand suitable for the double pen consists of a "cylinder "with a closed top;" a piston forces the ink through sponge into an oval cistern communicating with the lower end of the cylinder; on the side opposite to the cistern is a wafer-box."

[Printed, 3*s*. 10*d*. Drawings. See Repertory of Arts, vol. 15 (*second series*), p. 193; Rolls Chapel Reports, 7th Report, p. 199.]

A.D. 1810, March 22.—N° 3317.

GRANT, THOMAS.—"A method of making paint or varnish "from a newly discovered fossil, which will prove of the greatest "public utility in painting of ships and in various manufactures." The base of this paint is "any native earth containing a sufficient "quantity of very impalpable carbon combined with argill, silex, "metallic oxyds, and water, and other primitive matters of less "consequence than these;" or a "native black earth" which the patentee has lately discovered, possessing "all the requisite pro-"perties, particularly the carbonaceous or most essential princi-"ple." Sometimes he uses as a base "one or other of such "native earths in the crude state without any alteration."

He divests the earth of one or more of its ingredients, or he increases the proportion of one or more of the components, as the case may require, taking care not to diminish "the carbonaceous "principle." To prepare "a fine oil paint of a pure jet black," he grinds the prepared earth with any "suitable oil, varnish, or "medium, and either with one of these alone, or with one or "more of such fluids combined."

Among the uses to which he applies his invention he includes "all materials used for drawing." By mixing his base "with a "proper fluid," he forms a mass "capable of being moulded into "pencils, crayons, and other convenient shape, or into black "chalks."

"This native compound or earth is likewise an excellent "substitute for plumbago."

[Printed, 4*d*. No Drawings.]

A.D. 1811, May 9.—N° 3446. (* *)

JONES, THOMAS.—"A new instrument for dividing lines and "distances which will be useful to mathematicians, architects, "and draftsmen."

This instrument is called a "sectograph," and is composed of any convenient number of small bars (say nine) "of metal or "wood (but I prefer the former) each equal to each in length, "breadth, and thickness, perforated with a pin hole at each end "and one in the middle for the purpose of attaching them by "means of pins to the three sliding barrs" "laid across them "over the before mentioned pin holes. The three last mentioned "barrs are each perforated at equal distances with as many pin "holes (say nine) as there are barrs of the first mentioned "description, and the two setts of barrs are attached to each "other by pins fitted and secured in but not made fast in the "said holes." Besides the pin-holes already mentioned, the first-mentioned bars "have each a hole furnished with a dotting "point. These dotting points are for the purposes of marking "or transferring the required divisions, angles, &c." The dotting points are in the diagonal of the parallelogram formed by the instrument when it is put together. A graduated scale is attached by a screw to any convenient part of the framework. A clamp screw on the middle cross bar works in a "slit" in the scale which serves to fix the instrument in any desired position. By making the opposite corners of the apparatus recede or approach a line may be divided into equal parts, and other geometrical operations can be performed. The number of dotting points may be increased by means of short bars parallel to the tranverse bars.

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 24 (*second series*), p. 151.]

A.D. 1813, March 3.—N° 3655. (* *)

DELAHANTE, Alexis.—"The production or making of a "green colour, and the application thereof to various useful pur"poses." These are, as follows:—Nitrate of copper is mixed with half its weight or nearly that quantity of boracic acid, and the whole is exposed in a crucible until it has acquired a red heat, when the product is taken from the fire and is said to consist "of "the oxide of copper together with the acid of borax and a por"tion of nitric acid," and "is the green colour required." It is made in the humid way by "adding to a solution of sulphate of copper a solution of borax containing an equal or nearly equal weight of that salt to the salt of copper. This is done when both solutions are nearly boiling, or the "solutions and mixture "*may be made cold* and afterwards heated, but the process first

" described is greatly to be preferred." When the liquid is cold the precipitate is well washed, dried, and "exposed to a red heat." The colour it is said is further made by "combining the acid of " borax with the oxide of copper, and a portion of acid by other " methods which are well known to chemists by the general " denomination of indirect methods, and by means of salts con- " taining copper and any other acid not herein-before mentioned," but no other processes are given.

It may be mixed with "oil or varnish, or size or gum, or any " other of the adhesive fluids commonly used for painting and " also in the customary methods with vitrifiable matters for " enamel, glass, porcellain, pottery, and other paintings which " require to be fixed and completed in the furnace."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 30 (*second series*), p. 271.]

A.D. 1814, August 17.—N° 3837. (* *)

VANDERKLEFT, Henry William.—A "method of con- " structing a walking staff to contain a pistol, powder, ball, " and screw telescope, pen, ink, paper, pencil, knife, and drawing " utensils." The staff is made of brass and may be covered with any suitable substance. "The shape is round and rather conical, " tapering from the head to the point. It is divided into nine " parts, principally tubes (exclusive of the cap or head, and the " top or lid of the inkstand), which are all screwed together, " except that part containing the pistol, which is fastened by " means of two spring catches fixed opposite to each other."

The first division is an inkstand, on which the cap of the staff screws.

The second part serves for the handle of the pistol, and also contains a penknife, pen, and black-lead pencil.

The third part receives the pistol, which can be immediately disengaged from the case and from the lower part of the staff by pressing the spring catches.

"The fourth part is about eight inches in length, and forms a " telescope, with two or more sliding tubes."

The fifth part carries writing or drawing paper.

The sixth part contains Indian ink and hair pencils.

The seventh part contains a turnscrew for taking off the fore part of the pistol barrel.

The eighth part contains gunpowder.

The ninth part contains the pistol balls.

"The eighth and ninth parts are made of brass, and form " together the ferrule of the shaft."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 26 (*second series*), p. 88.]

A.D. 1817, July 10.—N° 4136. (* *)

BREWSTER, DAVID.—A "new optical instrument called the " kaleidoscope for exhibiting and treating beautiful forms and " patterns, of great use in all the ornamental arts."

"This instrument in its most common form consists of two " reflecting surfaces inclined to each other at any angle, but " more properly at an angle which is an aliquot part of 360°." " The plates should vary in length according to the focal dis- " tance of the eye;" or distinct vision of the object placed at the outer end of the tube in which the reflecting surfaces are mounted is obtained by an eye lens, when the said surfaces are shorter than the focal length of the eye. The tube is the length of the surfaces, and has a small aperture at the angular point of the reflecting surfaces at which the eye is placed. The successive reflections between the polished surfaces enable an eye placed at the aperture to perceive a circle of light divided into sectors; any object placed before the outer end of the tube appears repeated in every sector, "and every image of the object will " coalesce into a form mathematically symmetrical and highly " pleasing to the eye." The object may be made to move, and it may be coloured. Distant objects may be viewed by means of a convex lens placed beyond the reflectors, and in a tube exterior to the reflector tube. Three reflecting planes may be introduced; polarised light may be used, the effects may be exhibited to many persons at once (upon the principle of the magic lantern); and the figures can be traced by the camera lucida. Separating the inclined reflectors gives annular patterns, and rectilineal ones are shown by parallel reflectors. The kaleidoscope " seems to realise " the idea of an ocular harpsichord."

[Printed, 4*d*. Woodcuts. See Repertory of Arts, vol. 31 (*second series*), p. 321; Thomson's Annals of Philosophy, vol. 11, p. 451; Rolls Chapel Reports, 7th Report, p. 117.]

A.D. 1819, January 15.—N° 4330.

SMITH, CHARLES.—" Improvement in the method or form of " making up superfine oil and water colours for drawing, painting,

" and other purposes." This invention consists in the manufacture of colored pencils " capable of making perfect transparent or opaque " drawings on paper or wood, linen, or any other material by being " wetted or moistened with water, oil, varnish, spirit, or any other " liquid matter." Oil or water colours, " capable of being so " inclosed," are put into grooves cut in wooden cases, similar to those used for blacklead pencils; the two portions of the case are then glued together, rounded, and finished. Each pencil is japanned or colored outside " of the same teint it contains within."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 36 (*second series*), p. 349; London Journal (*Newton's*), vol. 1, p. 21; Rolls Chapel Reports, 8th Report, p. 131.]

A.D. 1822, December 20.—N° 4742. (* *)

HAWKINS, JOHN ISAAC, and MORDON, SAMPSON.—" Im" provements on pencil holders or port crayons, and on pens, for " the purpose of facilitating writing and drawing by rendering " the frequent cutting or mending of the points or nibs unneces" sary." The pencil holder is composed of the following parts:— 1. the nozzle, " into which the pencil or crayon is fitted so tight " as not to fall out by its own weight, but loose enough to be " easily protruded," and on one end of which are a male screw and two milled rims; 2. the nut piece, having a female screw at each end, the one to receive the screw of the nozzle, the other that of the driver; near the nozzle end of the nut piece are two milled rims; 3. the driver, " made of steel, one end of which is " cylindrical, fitting into and nearly filling up the nozzle;" its middle part is formed into a screw to work in the nut piece, the screw being somewhat longer than the cylindrical part; the other end " is made semi-cylindrical, of about the same length as the " screw, with a small part at the end quite cylindrical;" 4. a short brass tube (the outer diameter of which is the same as that of the nut piece) " put upon the semi-cylindrical part of the driver, and " having a steel pin through one side to prevent the tube turning " round upon the driver, but to allow it to slide the whole length " of the semi-cylindrical part;" 5. a long brass tube, fitting upon the nut piece and short tube, and having a pin to work in a circular groove of the nut piece and allow " the tube to be " turned upon the nut piece without coming off," and also a pin " going through its side and through the side of the short tube, " so that when the long tube is turned round it shall carry the " short tube around with it;" 6. a groove, around near the middle of the nut piece, "to receive a lapping of silk or other "elastic substance," for the purpose of preventing the long tube from turning too easily; 7. an outer case of metal or other substance fastened upon the long tube "to form an ornamental "handle to the pencil holder."

To make the driver draw the pencil in, a female screw is cut in the end of it, and the pencil is screwed thereto; or "for a short "distance" the driver is formed hollow, and longitudinal slits are cut in the sides, to allow the insertion of the end of the pencil. Several nozzles of different dimensions may be made to fix into the same handle by altering the shape of the driver below the screw, so that there may be put on it a separate cylindrical piece fitting each of the nozzles respectively. If "the varying in length of the handle is no objection," the nozzle is united with the nut piece; the driver is made "with a "short cylinder at the end of the screw," and the outer tube fits "tightly on, and is pinned to the larger end of the driver," and slides freely over the nut piece, projecting far enough beyond the end of the driver to form a socket for a handle of wood, ivory, or other substance.

Again, the male screw may be made "outside of the tube, "which corresponds to the nut piece and the female screw within "the outer tube," and the driver "an equal sized cylinder "throughout its length, except a short part at the handle end "larger to fix it in the outer tube." "This arrangement is "adopted, and the diameters of the tubes increased to make "room for a reserve of six pencils or crayons" at the upper end of the pencil case.

A case "for holding pencils or crayons nearly as long as itself" consists of a tube having a slot nearly the whole length, with the outside cut into a screw, and a cap or seal screwed on the upper end. The driver is a short cylinder, having a stud sliding in and projecting through the slot. A milled nut, "turning upon the screw of the tube and pressing against the stud," forces out the pencil or crayon.

The improvements on pens consist, first, in making the pens of tortoiseshell or horn, and in impressing into the nibs or wearing parts, "when they are softened with water at nearly the boiling "heat, small particles of diamond, ruby, or other very hard "substances;" secondly, "in affixing to the wearing parts of "tortoiseshell pens" larger pieces of the above substances, and securing the same by soldering or cementing pieces of tortoiseshell over them; thirdly, "in lapping a small piece of thin sheet "gold over the end of a piece of tortoiseshell," and pressing the gold into it while it is in a soft state, "and afterwards forming "the pen by cutting away the superfluous gold and tortoiseshell "together;" fourthly, in applying to the "nibs of pens, whether "made of tortoiseshell, horn, or quills, small particles of diamond, "ruby, &c.," and causing the same to adhere by means of any varnish or cement that is not corrodible by ink; and, fifthly, in placing against the back of the pen "two springs, or a forked "spring of tortoiseshell, horn, quill, or metal" to be slided to and from the nibs by a knob. "In the case of portable or "fragment pens" the forked spring may be fixed to the back of the holder, or made "a mere prolongation of the back or upper "jaw" thereof.

[Printed, 8*d*. Drawing. See Repertory of Arts, vol. 2 (*third series*), p. 219; London Journal (*Newton's*) vol. 7, p. 117; Mechanics' Magazine, vol. 33, p. 519; Register of Arts and Sciences, vol. 1, p. 166; Engineers' and Mechanics' Encyclopædia, vol. 2, pp. 277 and 284.]

A.D. 1825, March 23.—N° 5132.

RONALDS, **Francis**.—"A new tracing apparatus to facilitate "the drawing from nature." Two modifications of this invention are described, "one to be applied to the purpose of making "an original drawing, and the other to make a perspective drawing from a plan and elevation."

1. A board is supported on legs for the artist "to stand or sit "to." On the top of the board, at one side of it, are two brass studs, "having holes through them which receive rollers," and a rod "traverses easily from right to left, or left to right, upon the "rollers." A tube, screwed into a block through which the rod passes, stands at right angles with the rod and is fixed in position by a screw, and there is a plummet "to ascertain when the tube "actually is in a perpendicular position." A square, having a steel rod tapped into it, is fixed to the rod, and at the other end of the steel rod is a wheel "for the purpose of assisting it to "traverse backwards and forwards." A slide moves freely up and down the steel rod and is fixed by a set screw; in the slide "is a hole, tapped with a screw, through which a pencil is inserted," and "beside the pencil is a ball and socket to which is "screwed a handle." At one corner of the board an adjusting sight "is supported in such manner that it is situated opposite to

" or in the point of sight chosen for the subject to be drawn." A thread is fastened to the slide; it passes through an eye on the square, thence upwards by the side of the tube, over a pulley at the top of the tube, and thence downwards into the tube, where it is secured to a weight which moves up and down in the tube. On the thread is fixed a bead called the moveable point.

The model to be drawn being placed at a convenient distance before the board, the artist looks through the adjusting sight and by means of the handle brings the bead in a line with any point of the outline of the model; he then moves the slide in such a direction by means of the handle that the bead "shall be con- " tinually brought into visual or apparent contact with or (as it " will appear to the eye) pass over the outline of the figure," and the pencil "will trace a perspective outline thereof on the board."

This apparatus is also "applicable to the purposes of ruling all " perpendicular and horizontal lines."

2. Two rollers are "fixed at the upper end of supports erected " perpendicularly" upon a board; they support a bar "and allow " it to move freely from right to left and from left to right." To this bar is fixed another bar at right angles and having "grooves " cut through it, extending nearly the whole length of its upper " and lower portions." The drawing-board is placed on the top of the supports, and small steel bars are "fixed in such manner " to the upper part of the drawing board and to the lower ends " of the supports" that they may keep the upright bar in the requisite position. A slide, "to which is fixed a ball and socket " joint," moves easily "along the lower portion" of the upright bar. Another ball and socket joint is supported by a rod; this passes through a piece "which may be properly adjusted for the " horizon," and which slides into a groove on the under side of the board, "and can be firmly secured at any required distance " from the board." A steel rod, having a point called the moveable point, passes easily through both balls. A slide moves easily " along the upper portion" of the upright bar; in it is "a tapped " hole, through which a pencil passes, which pencil is made to " press with a proper force upon the paper;" a wire unites the two slides.

The artist by aid of a handle (placed near the moveable point) will be able to move the point "freely over any lines or objects " which may be drawn or planned upon the board;" and "if such " lines or objects constitute a ground plan, then a perspective

" view or sketch of that ground plan will be produced upon the " drawing board." If he wishes "to obtain a perspective view or " sketch of an elevation," he has only to move the point " over " the lines of that elevation drawn upon a drawing board erected " perpendicularly upon the board." The drawing board " may " be arranged horizontally," and the other parts " may be sup- " ported and placed in proper positions accordingly."

[Printed, 8*d*. Drawings. See London Journal (*Newton's*), vol. 12, p. 21; Register of Arts and Sciences, vol. 2 (*new series*), p. 202; Engineers' and Mechanics' Encyclopædia, vol. 2, p. 287.]

A.D. 1831, July 13.—N° 6136. (* *)

MORDAN, SAMPSON.—" Certain improvements in writing and " drawing pens and penholders, and in the method of using " them."

[No Specification enrolled. Title printed.]

A.D. 1831, August 10.—N° 6149.

ARDIT, JEAN MARIE ETIENNE.—(*A communication.*)—" A " machine or apparatus for drawing and copying, and reducing " drawings, and for taking panoramas." A steel bar is supported at one end by a wheel, " the axis of which is parallel to the steel " bar and lengthens it," and the other end slides in a mortise formed through a carriage whose wheels are grooved triangularly and run on a cylindrical guide rail having under it " some small " points to fix it on the table on which the drawing is to be " made." The wheels are of equal diameter, and some instruments have above the single wheel "a screw to regulate the " height;" nuts are placed at the extremities of the axes " to " regulate the play on their axes and at the same time keep them " from shaking."

A pencil case slides on the bar in the following manner:—The bar passes through a mortise cut in a box or plate; a plate, sliding on the box in a dovetail, and fixed to it by a tightening screw, carries a tube " soldered to it vertically;" this tube is slotted, and an inner tube (which serves as a pencil case) moves up and down it by aid of a sliding ring and pin; on the top of the inner tube is a cup in which a weight can be put, so that " more or less force " can be given to the pencil mark," and the pencil can be raised off the paper by means of a small lever.

At each extremity of the bar is a brass standard, " having in its " whole length a small groove," and a pulley at the top and at the side of its base; each standard "may be inclined at pleasure," or be taken off, being fixed by a screw "which forms the axis on " which fastens the joint." On the one "slides freely but with-" out shaking" a square box having inside a pin "which runs in " the groove and prevents the box from turning round." An ocular with several holes slides in the box by means of dovetails, and a screw fixes the box to the standard. A wire fastened to the box goes round the pulleys and is secured to a button on the steel-bar box. On the other standard slides a square box carrying a little frame, across which "is placed a hair destined to receive a " colored point or sight." The frame is sometimes double; "a " drawing screw may move as required the sight to the right " or left, to make it coincide with the point of the pencil. If, in " the case of renewing the point, it should not fall exactly on " the same place, a thread is fixed to the box," goes over the upper pulley, and holds suspended a weight inside the standard. A wire passes from the bottom of the frame round the lower pulley, and is fastened to another button on the steel-bar box. The standard near the single wheel "may be taken off and placed on a "cramp" which is fixed to a table; the ocular being then fastened by the screw, " the machine becomes the ordinary " diagraphe." The other standard also may be taken off "to " render stationary the sight, leaving nothing but the eye move-" able." Lastly, " the instrument folds on itself and occupies by " this means very little room."

" Description of the diagraphe for taking panoramas." This instrument is composed, like the preceding one, " of a steel rod, " a pencil case, a carriage, and of the conducting tube of the " frame." The single wheel "is replaced by a train of wheels" mounted "under the extremity of a long box" which slides easily without shaking along the steel bar. At the upper part of the box are "two small ivory wheels between which a steel rod " passes;" this rod, as well as a brass bar, is "carried upon two " carriages furnished with grooved wheels" that run upon two parallel rods. The ocular is placed in the middle of the brass bar. The train of wheels "runs upon a steel spring which is " made to take all the curves of the circumference of the cylinder " upon which the panorama is made; the curve is fixed to the " board by the means of little points. At each movement of the " diagraphe the train of wheels, forced to run upon a curve which " approaches or leaves the principal conducting rod of the dia-

" graphe," will cause the box to slide on the bar, and the ocular " to approach the sight, according to the ordinates of the " conducting curve of the train of wheels."

The specification contains a detailed description of " the various " parts used," and the description is illustrated by many drawings.

[Printed, 1*s.* 2*d.* Drawings. See London Journal (*Newton's*), vol. 11 (*conjoined series*), p. 93; Register of Arts and Sciences, vol. 6 (*new series*), p. 236.]

A.D. 1832, September 8.—N° 6301.

BURGES, CAROLINE ELIZA ANN.—" An improved apparatus " for sketching, drawing, or delineating." This apparatus consists of two frames, " to be placed upon any convenient standard " for the purpose of holding a diaphanous medium, upon which " the outline of any figure or object seen within the area of the " medium may be accurately and readily traced." The medium is a piece of thin muslin or gauze or other fabric of a fine texture, " stretched over a transparent plate of glass;" it is intended " to receive the outline of the picture as traced upon it " by a common black lead or chalk pencil." Or the glass alone may be employed as the medium to be sketched upon " by using " a prepared pencil made of certain combinations of materials." The sketches or outlines produced upon either " may afterwards be " traced or transferred to the paper or other material upon which " the finished picture is to be drawn." On the face of the inner frame are placed a " number of small metal pins or points stand- " ing outward, and on applying the muslin or gauze it should be " slightly stretched over the frame, when the metal points will " catch hold of the muslin, and on the glass being pressed into the frame " the muslin will become stretched tight over its surface and may be secured in that position by buttons. The inner frame is then put into the outer one and fastened in by buttons, " when the instrument will be ready for use." A weight suspended by a cord will enable the artist to adjust the frame containing the medium " to a horizontal and perpendicular posi- " tion." To keep the head of the artist " steady and in one " position during the time he is drawing " a head rest is employed, and to this " an eye-piece may be connected by an adjusting arm."

The patentee describes a method of retracing the sketch or outlines on paper, a standard for her frames and head-rest, and ingredients for making her prepared pencils, but she does not lay claim to either as her invention.

[Printed, 10*d.* Drawing. See London Journal (*Newton's*), vol. 2 (*conjoined series*), p. 153; Rolls Chapel Reports, 7th Report, p. 140.]

A.D. 1834, February 27.—N° 6565. (* *)

HARDING, James Duffield.—"Certain improvements in "pencil, pens, and chalk cases or holders." According to one plan, the tube of a pencil or chalk holder has affixed to its lower end "a gently tapering metal cone," "made cylindrical within-"side of it." This cone is likewise "slit or cleft in three or more "equidistant places longitudinally, to allow of it closing and "again springing open." A sliding ring can be slipped along the cone, and retained in any desired part of it by means of alternate gaps made in the sides of one of the longitudinal slits, a pin being placed in the sliding ring, so as to enter one of the said gaps.

Another plan consists in fixing a tapering cleft screw to the tube, a tapering, hollow, screwed ring closing the screw "more "or less as required, it springing open again of its own accord."

Another mode of securing pencils or pens in these metal cases or holders, is "by means of a metal screw," which is screwed or "fitted into a hollow screw made on the metal cylindrical tube," "and can be made to enter into the cedar pencil or wooden "penholder by screwing it into them, and thus to retain them at "any required length in use."

[Printed, 6*d.* Drawing. See London Journal (*Newton's*), vol. 10 (*conjoined series*), p. 350.]

A.D. 1834, November 15.—N° 6715.

GARNER, Samuel.—"An improvement in the art of multiply-"ing certain drawings and engravings or impressions." This invention consists "in the formation, preparation, and treatment "of plates of zinc," so that they may be employed instead of slabs of stone "for the multiplication of copies of writings, plans, "or designs." The metal (of the purest quality) is cast in moulds into plates of uniform thickness; the plates are subjected to the pressure of a pair of metal rollers, "passing them through at a "temperature at which the metal is malleable, alternately in the "direction of the length and breadth," and to insure "accurate "uniformity of thickness," they are planed on one or both of their faces by a planing engine. A roughness or grain is imparted to the face by rubbing it " with some cutting substance in a " pulverulent form " or " in masses or lumps," using therewith " water or other non-solvent liquid." If it be required to give a different grain to different parts of the same plate, " grinding " materials of different qualities " are employed in different parts. The material is washed off, and the plate is cleansed " by washing " with a solution of alcali, either potass or soda, caustic or sub- " carbonated." After the lines or traces are made on the plate (which is done as in lithography), they are " fixed and prepared for " the subsequent operations " by brushing an acidulous liquor over the face; the patentee details the composition of a liquor that he prefers; when the liquor has acted thereon the plate is washed with clean water, " and then the work may be covered " with gummed water."

" In pulling off impressions from the zinc plates," any presses may be used that give " adequate pressure over the whole surface " of the plate."

[Printed, 4*d*. No Drawings. See London Journal (*Newton's*), vol. 6 (*conjoined series*), p. 77; Rolls Chapel Reports, 7th Report, p. 156.]

A.D. 1834, December 18.—N° 6732.

RETTFORT, RICHARD.—(*A communication.*)—A " machine or " apparatus called a ' physiognotype,' by means of which a perfect " fac-simile of the human countenance can be immediately pro- " duced, or the exact copy of a bust or sculptured figure or of a " living or other subject taken." The apparatus is contained in " a hollow cylindrical drum, or it may be of any other suitable " shape." Inside are two parallel metal plates " as diaphragms " extended across it," and behind these a moveable plate having a handle which projects through a hole in the back of the drum. The parallel plates are perforated with a multitude of small holes as close together as possible and " in exact coincidence," and in these holes are inserted fine wires all of the same length " and " filling up the whole area of the drum." The wires slide freely in the holes, " and are brought into coincidence " by the moveable plate. When the apparatus is about to be used, it is suspended by strings, the wires " ranging horizontally," and the moveable plate " being withdrawn from behind the back ends of the wires." A slight pressure of the face against the front ends of the wires " will cause the wires severally to recede and leave a recess in " front corresponding with the projections or form of the face."

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To fix the wires in the position which they have assumed, melted tallow or beeswax or some such substance is poured into the drum between the perforated plates; the substance, when cold, will hold the wires firmly, and the recess in front will form a mould or matrix. To release the wires "hot water may be poured into an outer casing or vessel surrounding the drum, which is provided with two funnel-mouthed cocks and a discharge tap.

[Printed, 6*d*. Drawing. See London Journal (*Newton's*), vol. 6 (*conjoined series*), p. 288; Rolls Chapel Reports, 7th Report, p. 157.]

A.D. 1835, May 13.—N° 6831. (* *)

DUNKIN, THOMAS.—(*A communication.*)—"Certain improve-" ments in the mode, method, or system of obtaining or producing " duplicate copies of manuscripts, writings, and drawings, and in " the apparatus or machinery used in the same." A "prepared " ink" and "an impalpable powder" are required to effect the improvement in the mode of producing duplicates. The ink is made by adding to "eighteen parts in weight" of "ordinary " writing ink, six and a quarter parts of sugar candy, two and a " half parts of deliquescent salt, such as marine salt, hydrochlo-" rate of lime, chlorine or calcerine, &c." The powder "for black " line writing or drawing" may be composed of "sulphate of " iron, or the acetate of iron, gall nut or gallic acid, sugar candy, " and lamp black, the proportions being varied according to the " intenseness of the colour or the number of duplicate copies " wished to be obtained." Having written a page or produced a drawing on a sheet of paper or other material with this prepared ink, "or a gummy liquid not susceptible of drying im-" mediately," place it on or under a waterproof, varnished, or polished oiled silk or skin, or other proper surface laid on the bed board of the press; put on them "a double cloth or a " smooth cardboard," and pass the whole through the press between the rollers; the writing or drawing will be transferred to the surface in contact with it. Cover the transfer with the powder; sweep off "all that does not adhere to the lines;" breathe over the whole surface "until the lines appear black and are " damp," or place upon it "damped linen, stretched over a board " or on a sheet of metal with the edges turned up, and slightly " wetted with a sponge," so that the transfer may be damped without being touched; then lay a sheet of paper on it, pass both through the press, and a "first duplicate copy" is taken. Repeat the process each time "according to the number required or that "which the transfer will give." "When the transferring surface "fails in taking up sufficient ink powder to produce a perfect "impression," wash it "with a wet sponge, and it will be ready "to take another transfer."

The improvement "in the construction of the press for pro-"ducing duplicate copies on the leaves of bound books" consists "in the application of a rod supported in ears or notches in front "of the bed board of the press, which rod is to be passed through "the hollow back of the book to support it while the impression "is being taken," there being notches or recesses in the supporters of the rollers "to allow the rod and book to be brought "sufficiently near to the rollers to take the impression up to the "inner extremity of the leaf." The press used is "a common "double roller copying press," with the above improvement adapted to it.

[Printed, 8*d*. Drawing. See London Journal (*Newton's*), vol. 7 (*conjoined series*), p. 218; Rolls Chapel Reports, 7th Report, p. 163.]

A.D. 1835, December 8.—N° 6947.

PARTRIDGE, NATHANIEL.—"Improvements in mixing and "preparing oil paints, whereby a saving of ingredients commonly "used will be effected." This invention consists in "the appli-"cation and use of solutions of lime in water, or a composition "of lime water and oil in the mixing and preparing of oil paints "for the useful and fine arts severally."

The solution is made as follows:—"To about twenty gallons of "cold water, or if distilled the better, apply three or four pounds "of fresh burnt lime, put them into a cask, stir it well about, "and let it stand about twenty-four hours, or until the water is "quite clear, when it may be drawn off as wanted; it should be "stirred up every six or seven days that the water may be kept "fully impregnated with the lime," and it should be "kept from "the air and as cool as possible."

To mix the lime water with the oil put them "in about equal "parts" into an open vessel, and whisk them well together; or put them into a bottle or jar "and shake them together until "completely blended;" let the mixture be well shaken before mixing with the pigments.

The patentee describes his method of preparing paints for outdoor and in-door work and for flatting; "for the fine arts," he says, "the colors should be ground in such proportions of oil and " lime water as may be found requisite, as the exact proportions " cannot be stated;" but it is desirable " to incorporate as much " lime water as possible in order to render the paints crisp or " short to the touch, and transparent." When " sugar of lead is " used as a dryer," it is dissolved in the lime water.

To prepare a composition for thinning colours on the palette, " or what is called by artists magnelph," a little mastic varnish is added to the mixed lime water and oil.

[Printed, 4*d*. No Drawings. See London Journal (*Newton's*), vol. 12 (*conjoined series*), p. 108; Rolls Chapel Report, 7th Report, p. 168.]

A.D. 1836, March 30.—N° 7052.

PARLOUR, SAMUEL.—" Improvements applicable to sketching, " drawing, or delineating, which I intend to denominate Parlour's " sketching case." The sketching apparatus is composed of a hollow standard, a stem sliding up and down in the standard, and four frames. The standard " moves stiffly " on a hinge which is screwed to a portfolio or case; at the upper part (which is split) is formed a screw whereon a nut works, thereby causing the upper part to press on and retain the stem in position. A frame, containing a square piece of brown or other colored glass, " moves stiffly " on a pin or axis " at the upper end of the stem. At the near end of this frame " is a frame containing a lens to suit the sight of " the person using the instrument, and to clear the point of the " pencil when sketching," and at the farther end is a third frame, each moving on an adjustable axis. The fourth frame contains a reflector consisting " of a square plate of glass silvered on the " back;" this is suspended from the third frame on an axis " and " is capable of adjustment by means of a short screw and nut," the screw passing through a slot in the third frame.

Directions for use:—The frames being set " in such manner as " to produce the object it is desired to sketch to appear as if it " were reflected on the plane below the eye " of the artist, the hand " can be seen clearly by the eye on looking through the " instrument, and hence as the object appears to the eye to be " reflected on the plane below, if such plane be a sheet of paper " placed on a portfolio or case, the sketch desired will be " obtained."

[Printed, 8*d*. Drawing. See Repertory of Arts, vol. 7 (*new series*), p. 28.]

A.D. 1838, August 30.—N° 7786.

DOLIER, William.—“A certain durable surface or tablet for “ the purposes of receiving writings, drawings, or impressions of “ engravings or other devices capable of being printed, which “ surface may be applied for roads or pavements, and part of “ which invention may also be used as the means of strengthening “ and beautifying glass.” The patentee describes in the first part of his specification two surfaces or tablets, the one rigid, the other “perfectly pliable,” for receiving writings or drawings “ which may be removed at pleasure by moisture.”

The material of which the former is composed is “common “ glass enamel made in the ordinary manner from flint glass, “ borax, and arsenic;” it is rolled out into thin plates, and after it has been ground smooth and polished, the glazed surface is removed “by grinding with the finest emery powder, and then “ the tablet is ready for use.”

The foundation of the latter is “a sheet of linen, silk, cotton, “ or other cloth;” this is to be treated as follows:—“Upon the “ reverse side of the sheet” is to be spread one coat of size or varnish “made by dissolving one pound of buffalo skin in one “ gallon of water over a slow fire,” and when this is dried, the other side is to be rubbed with pumice stone “in order to remove “ all inequalities and leave the surface perfectly smooth.” This surface “is now to be coated three times with a mixture of the “ purest white lead, called flaked white, with boiled linseed oil “ and spirits of turpentine in about the proportions of one pound “ of white lead to one quart of oil and half a pint of turpentine,” and when this has become perfectly dried, “the flexible surface “ is ready for use.” The back or reverse side of this prepared cloth may be flocked “with pulverized woollen cloth;” or a gold, silver, or bronze surface may be given to it.

[Printed, *4d.* No Drawings. See London Journal (*Newton's*), vol. 14 (*conjoined series*), p. 150.]

A.D. 1840, February 22.—N° 8394.

WINSOR, William.—“Methods of preserving and using “ colours.” The colours are powdered, brought “into a pasty “ consistence,” and put into “cylindrical tubes of glass or other “ substances,” but by preference clear glass. The tube is open at both ends, each formed with an external rim; inside is a piston cut with a female screw, into which a male screw is fitted, as long as, or rather longer than, the tube. The piston is formed of alternate discs of cork or other elastic substance, and card or other substance not so elastic as the cork, or of discs of cork only, perforated in their middle so that they can be arranged upon a block of hard wood, bone, or metal. The discs are secured to the block by gum, glue, or cement which is not "soluble in the liquid " with which the paint or colour is prepared." The male screw is made of any suitable material, and to its head is affixed a flat plate for the purpose of turning it. A flat circular disc, rather larger in diameter than the tube, and perforated in the middle for the easy passage of the screw, is secured upon the end of the tube next the piston by tying over it a piece of membrane "large " enough to reach below the rim." There may be also a plate or stop fixed upon the upper part of the screw to act against the inner side of the circular disc. The tube is filled from the open end, which is covered and secured by a disc and piece of membrane as before described. The hole made in the bottom disc and membrane (to permit the colour to be forced out for use) is by preference about $\frac{1}{16}$ of an inch in diameter; it is kept closed by a plug of any suitable material.

The patentee describes various slight modifications of arrangement for the tops and bottoms of the tubes, and sometimes he substitutes a rack and spring for the male and female screws. He makes also boxes or cases to hold one or more rows of tubes.

[Printed, 10*d.* Drawing. See Repertory of Arts, vol. 17 (*new series*), p. 282; Mechanics' Magazine, vol. 33, p. 380; Inventors' Advocate, vol. 3, p. 196.]

A.D. 1841, February 18.—N° 8852. (* *)

DRAKE, JOHN COLLARD.—"Improvements in scales used in " drawing and in laying down plans."

"The scales used are to be made from the paper on which the " map or drawing is to be laid down, and the scale so made and " used for the purpose of laying down the plan is, after the plan " is made, at all times to go with the map or plan, by which means " the scale and the plan being of the same materials, and simi- " larly acted on by atmospheric changes, the scale will at all " times have the same relation to the plan as when the drawing " or plan was first produced from the paper scale."

"Although it is a great improvement on the old mode to make " the scale from the paper mounted on linen or cotton by paste,

“ yet, in order to obtain the fullest advantage of my invention, I “ employ india-rubber cement in place of paste in mounting the “ paper on linen or cotton.” The linen being stretched, one surface of the paper is damped, india-rubber cement is applied to the other surface, and also to the linen; the paper is then spread on to the linen.

A suitable strip for making the scale is cut from the india-rubber prepared paper, and is employed in conjunction with a straight edge, especially designed for using with the said paper scale. The under surface of the straight edge has a surface of paper or linen affixed thereon, leaving a space to receive the scale.

To facilitate the placing of the offset scale accurately on the divisions of the paper scale an offset scale is employed that has “ a “ line of wire,” “ by which the divisions of the paper scale may be “ more accurately worked from.” The offset scale works against the straight edge.

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 16 (*new series*), p. 221; London Journal (*Newton's*), vol. 22 (*conjoined series*), p. 46; Mechanics' Magazine, vol. 35, p. 208; Inventors' Advocate, vol. 5, p. 133.]

A.D. 1841, March 6.—N° 8863.

RAND, JOHN.—“ Improvements in preserving paints and other “ fluids.” The paints, &c. are enclosed “ in thin drawn tubes or “ cases of the metal tin, or of such other metal as shall be of “ such tenacity and pliability and little elasticity ” that the tubes may be closed at both ends air-tight “ by merely folding over the “ said metal ” once or more times, after the manner of “ a hem “ in needlework,” and “ nipping the seam so made.” The contents are “ easily squeezed out by collapsing ” the tubes, thereby causing the sides “ to come and remain together behind their “ contents in such a manner as to exclude the atmospheric air “ from the end from which the contents are expressed.”

Some tubes have at one end “ a nozzle or spout,” on to which “ an air-tight cap ” provided with a cork is screwed.

The tubes are filled “ through a spout or funnel of such form “ and dimensions as to nearly fill the capacity ” thereof; the paint, &c. is “ pressed through ” the spout, and the filling tube “ is gradually drawn out, thereby leaving the preserving tube or “ case full,” allowance being made for the seam, “ which is to be “ folded over after it comes off the filler.”

[Printed, 10*d*. Drawing. See Repertory of Arts, vol. 16 (*new series*), p. 333; London Journal (*Newton's*), vol. 20 (*conjoined series*), p. 22; Mechanics' Magazine, vol. 35, p. 239; Inventors' Advocate, vol. 5, p. 165.]

A.D. 1841, June 12.—N° 8987.

PALMER, Edward.—" Improvements in producing printing " surfaces, and printing china, pottery ware, music, maps, and " portraits." This invention consists in "obtaining printing " surfaces by drawing and painting on silver, or copper, or other " metallic or conducting surface or surfaces, or by painting or " drawing on other surfaces made conducting after painting or " drawing thereon," so as by the use of "the known process of " electrotype or electrography" to obtain plates with (1) sunken surfaces, (2) with raised surfaces, from which prints may be taken.

1. The plate is, if required, "made metallic for the process " of electrotyping," and has affixed to the back a small strip of copper "for the purpose of connection with a voltaic battery." The artist makes his outline thereon or transfers to it "the " outline of a sketch already made." He then proceeds with the painting, employing brushes of the ordinary materials "either " in the common form or cut in different ways to facilitate the " production of the effect intended," occasionally points of wood, ivory, and metal, and "a dabble of silk or other material," and a composition of the following ingredients and proportions, although the patentee does not confine himself thereto; namely, 1 part (by weight) of white wax, 2 of lard, and 1 of lampblack, melted together and stirred until nearly cold. The compound is to be ground for use with a small quantity of olive oil. The painting, when finished, "is to be slightly touched in the dark " parts with plumbago (in fine powder) or other suitable material " for making the surface conducting." To produce "a washy " texture" the composition preferred is made of equal parts of wax and ivory black ground with olive oil and thinned with spirits of turpentine. This composition will be hardened by passing over the painting a soft brush containing plumbago.

2. The required subject is painted on "a darkened or black " copper or plate" with a composition consisting of 2 parts (by weight) of sulphate of lead, 2 of lard, and 1 of wax melted together, stirred until nearly cold, well ground, and thinned, if required, with a little olive oil; should it require thickening sulphate of lead must be added. In addition to the instruments before-mentioned "an instrument with several projecting points " somewhat resembling a comb" is employed. "A beautiful " dragged texture is produced by using the composition thinned

" a little with spirits of turpentine with a soft brush held in a " slanting direction and passed quickly over the surface."

The whole of the process for producing printing surfaces is explained at length in the Specification.

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 17 (*new series*), p. 101; London Journal (*Newton's*), vol. 20 (*conjoined series*), p. 172; Mechanics' Magazine, vol. 36, p. 28.]

A.D. 1842, September 29.—N° 9480.

RAND, JOHN.—" Improvements in making and closing metallic " collapsable vessels." The principal use of these vessels has been " for containing artists colours;" the patentee does not confine himself to such use. He employs two punches and two dies; each punch is convex at bottom and has a spike affixed to it; the one first employed has a cutting edge. One punch and die partially form the vessel out of a sheet of thin malleable metal, the other complete it, except the closing of the bottom " by folding " or otherwise." The die employed for the completion of the vessel " is so formed as to produce a short neck " on each vessel. A tube passing through the die rests on a lever, by which it is raised in order to force out the vessel from the die.

If the vessel is to be made without a neck, the spike is dispensed with, and a rod is used instead of a tube.

If a screw is to be formed on the neck, the die has a screw thread cut in it, and the spike is of larger diameter, so that the metal of the neck is forced into the thread of the die.

Screw caps are made by cutting a male screw on the punch.

The punches are worked by a fly press or other suitable machinery. The punches and dies may be of any corresponding shapes, and the dies may be engraved, &c.

[Printed, 10*d*. Drawing. See Repertory of Arts, vol. 1 (*enlarged series*), p. 321; Mechanics' Magazine, vol. 38, p. 488; Artizan, vol. 4, p. 100; Patent Journal, vol. 1, p. 377.]

A.D. 1842, December 3.—N° 9531.

COBBOLD, EDWARD. — " Improvements in instruments for " writing or marking, part or parts of which improvements are " applicable to brushes for water color drawing." This " artist's " color brush " is " capable of supplying a larger amount of water " colors than the brushes in ordinary use." It is composed of two hollow cones fitted to the ends of a quill or other suitable receptacle. The lower cone (into which the brush portion is inserted) is grooved on the outside from base to point; it is also perforated, and the perforations are stopped by taper screws or by taper stoppers which are actuated by levers somewhat similarly "to the low C keys of a flute." The upper cone has a tightly-fitting screw in its apex.

To charge the brush the screw in the upper cone is taken out, the others are loosed, the lower cone is immersed, and the liquid is drawn in "by the mouth or other suitable mode at the orifice "in the said upper cone." The screws are then set fast, and the supply to the brush is regulated by the "adjustment of the said "screws."

[Printed, 8*d*. Drawing.]

A.D. 1843, January 26.—N° 9603.

CHAPMAN, Henry.—"A fabric for maps, charts, prints, "drawings, and other purposes." This fabric, which the patentee proposes to call "paper cloth," is made in the following manner:—"Canvass, gause, muslin, calico, linen, or other similar fabric" is wound smoothly and evenly upon a roller. The whole is introduced "into a convenient situation between the upright felt, or "third press felt, and the drying cylinders of a paper machine." Between the roll and the felt is placed a trough containing adhesive material and a freely-turning roller whose lower part dips into the material. The paper is made in the ordinary way; and when the endless sheet "has been led through the machine, "and the making of it is proceeding properly," the end of the fabric is brought over the roller and led onwards; the motion causes the roller to revolve and bring up the adhesive material which is taken up by the fabric. The paper and the fabric are brought into contact between "the third or last press rolls," whereby the two "are firmly united," and "being led over the "steam or drying cylinders" are thereby dried.

The adhesive material which the patentee has "hitherto found "to answer best in practice" is prepared as follows:—Common soda is dissolved in water, 4 parts of soda in 15 of water, and 9 parts of the best yellow resin, dissolved "by heat," is added thereto; the whole is boiled for an hour, "a minute quantity of "linseed oil being introduced occasionally to prevent frothing;" 1 part of the best glue is then put in, and the whole is diluted "with one and a half times its bulk of water and strained "through flannel." The quantities "are all taken by weight."

Finally, the whole is "well mixed and heated, but not boiled, and " is used hot."

The foregoing process is the one that the patentee usually employs "with cloths of a close texture." The process may be varied in some respects (which he describes), and when the fabric is "book muslin," he dispenses with the adhesive material.

" Paper cloth with a single paper surface may be supplied with " a second paper surface by a repetition of any of the processes," and the quality, thickness, and colour " may be varied according " to the purposes to which the paper cloth is to be applied."

Directions are given for making the paper surface "particularly " hard."

[Printed, 4*d.* No Drawings. See London Journal (*Newton's*), vol. 23 (*conjoined series*), p. 188; Mechanics' Magazine, vol. 39, p. 270; Engineers' and Architects' Journal, vol. 6, p. 437.]

A.D. 1843, August 8.—N° 9862.

BOURJOT, Charles. — " Improvements in apparatus for ob- " taining the profile of various forms or figures."

[No Specification enrolled.]

A.D. 1843, November 21.—N° 9955.

MORDAUNT, Octavius Dillingham.—(*A communication.*)— " Improvements in apparatus for obtaining the profile of various " forms or figures." The apparatus consists of a series of thin sliding pieces confined in a frame, " capable of sliding in contact " with each other in order to take a profile of any surface, and " then of being fixed to retain such apparatus with the profile so " obtained." The pieces are "very thin, and pointed at their " ends ;" they move between two side plates whose inner surfaces are covered with thin wash-leather or other suitable material, and at each end between the plates is a filling piece " as thick as the sliding pieces are wide." If it be required to have a horizontal and vertical line to work from, " a square with " a spirit level" can be attached to one of the side plates by a pin-joint. When a profile has been taken by pressing the sliding pieces " so as to cause each of them successively to come against " the part of the figure opposite to that end," the filling pieces are put in, and the whole is secured by means of two screws and nuts, which cause the side plates " to press so strongly on the " edges of the sliding pieces between them that they will be held " fast."

The profile thus obtained may be transferred on to paper or other surface "by laying the apparatus upon the paper and " moving a pencil or fine pointer along the ends of the sliding " pieces."

"The horizontal and vertical lines may be obtained" by moving another sliding plate with the pencil "along the edges " of the square."

[Printed, 10*d*. Drawing. See Repertory of Arts, vol. 4 (*enlarged series*), p. 18; London Journal (*Newton's*), vol. 24 (*conjoined series*), p. 347; Mechanics' Magazine, vol. 41, p. 55; Engineers' and Architects' Journal, vol. 7, p. 237.]

A.D. 1844, January 16.—N° 10,016.

NEWTON, William Edward. — (*A communication.*) — " Improvements in machinery or apparatus for facilitating the " tracing and copying of designs, drawings, and etchings of all " kinds, either of the original size or upon an enlarged or " reduced scale." This invention consists "in a new application " of or rather a novel method of employing the camera obscura," and in order to adapt it to copying drawings on the same or on a larger or smaller scale the following conditions are indispensable:—(1), the frame carrying the camera "must be capable of moving " easily in a vertical direction;" (2), the drawing to be copied must be placed in a frame which "must have a lateral and also a " backward and forward motion, either horizontally or vertically," according as the light is received from above or at the side; (3), " the apparatus carrying the lens must also be moveable."

Description of a machine in which the light is received from above:—A wooden framing, about eight or nine feet high, is formed of four uprights about four and a half feet apart; the uprights are joined by cross pieces, four at the upper and four at the lower part, and strengthened by eight iron supports "fixed " diagonally to the upper part." An inclined mirror is supported " between two uprights on two pins, pivots, or axles" in a moveable frame, which is "formed of four cross pieces firmly " joined together," and moves up and down, and is held suspended in the framing by means of cords, weights, pulleys, and antifriction rollers. This frame carries "two grooved cross " pieces," in which a second frame "moves in the direction of its " breadth," and inside the second is a third "moveable therein " in grooves in the same horizontal plane, but in a direction at " right angles," namely from front to back. The third frame

" is furnished with a plain glass upon which is placed the design " to be copied," and the second and third " are moved by hand " with the help of cords and pulleys." Underneath is another frame, also moving up and down, and held suspended by cords, weights, &c.; " it is painted black underneath, and furnished all " round with some black stuff, so that no light may enter the " interior, except that from above;" it is perforated in the middle " to allow the light to pass and to receive a double convex " lens," which is fixed in a tube sliding inside another which is " stationary and of about four inches in diameter; it is con- " structed so as to receive the lens either at the upper or lower " part;" this tube " is furnished with a rack and pinion for " raising or lowering it." The design to be copied " must be " upon varnished or transparent paper," and the size of the copy to be made is previously to be fixed on paper placed on a table below, " by marking the distances thereon, which serves as a " scale for the whole and also as a guide to regulate the height " of the two frames and of the lens and its moveable tube."

This machine may be employed " for copying and altering the " proportions of designs drawn upon ordinary paper, not trans- " parent;" also for " restoring designs executed upon fabrics of " any sort; but in this case the glass is dispensed with." The frames for receiving the drawings must be vertical and " capable " of moving in such a manner that all the parts of a design may " be successively brought in a vertical position opposite a prism, " so as to be thereby reflected downwards and pass through the " lens."

A machine, " receiving light at the side," is " constructed upon " the same principle " as the one above described, " but the " arrangement of some of the parts is somewhat altered and " modified." A frame, capable of moving in three different directions, " receives the design to be copied or reduced, which " is held therein between two plates of glass." The design (on transparent paper) " is placed in a vertical position against the " light which must pass through it before entering the camera " obscura." To copy a design on a different scale from paper that is not transparent " a prism or reflector must be used, as was " observed with regard to the machine admitting light from " above." The Specification contains a full description of this machine and its movements.

[Printed, 10*d*. Drawing. See London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 225; Engineers' and Architects' Journal, vol. 7, p. 236.]

A.D. 1844, June 6.—N° 10,219. (* *)

WOODS, Joseph. — (*A communication.*) — " Improvements in " producing and multiplying copies of designs and impressions " of printed or written surfaces." The improvements consist, first, " in the process termed anastatic printing, or obtaining " reversed facsimiles on metallic surfaces from designs, writings, " &c.;" and secondly " in the presses for obtaining impressions " from the said metallic surfaces."

The metal preferred is zinc, used in the form of plates or cylinders, and polished by grinding with emery in parallel lines. The design may be drawn on any clean well-sized paper with ink of a saponaceous or fatty nature. An " original " is charged with nitric or other " convenient " acid. If freshly printed, so as to yield a set-off, it is saturated with the acid applied on the wrong side. It is then laid with its printed side upon the prepared plate, and passed with the plate under considerable rolling pressure, the reverse side being covered with blotting paper. Or the paper may be laid between two prepared plates, and an impression taken on both in the same way. Originals "of more than two months " old " are laid to soak in the acid for a period varying from twelve hours to some days, according to the length of time they have been printed. The strength of the acid in which they are immersed is reduced by the addition of water to such a degree as not to taste strongly. The papers are partially dried by blotting paper laid on the polished surface, and subjected with the plate "to much greater rolling pressure than before." If saving of time is an object, " and when the originals have been " very much indurated and dried, as in engraving, &c.," they are placed in a solution of caustic potash, and afterwards face uppermost in a solution of tartaric acid, which leaves the imprinted parts covered with crystals of cream of tartar. The " back lines " are then revived, either by passing a hard lithographic roller charged with ink over the original and cleaning off with an uncharged roller, or by means of the vapour of " convenient volatile oils," such as oil of turpentine, after which the crystals of cream of tartar are dissolved by immersing the original in dilute nitric acid. " When I wish to draw on the plate, I do so " with lithographic transfer ink while in its clean state, and wash " it over lightly with gum water containing a small quantity of " phosphatic acid, then rub in ink, and protect the black surfaces " as next described; or I first treat the metallic surface with

" phosphatic acid and gum; wash it clean, scrape away the parts " intended to carry ink, and rub them up as hereafter described." The original having been removed, the plate is washed over with thick gum and rubbed up with a mixture of lithographic ink and gum water wherever it has been protected from the action of the acid. In the transfer of old work, "this process should be repeated " at intervals of one hour or more." The plate is then washed with water and charged with ink with a soft leather roller. Spots of dirt are ground out with slate pencil and water. A "few " hundred copies" could be printed "in the usual mode" from the plate as thus prepared; but as the fine lines have a tendency to thicken, the plate is washed over with a "solution of the " substance called by Dulong phosphatic acid, or, as termed by " Davy, a mixture of phosphorous and phosphoric acids, mixed " with gum water." The surface is thus slightly etched so as to reject the ink, or by continuing the process with stronger acid it may be transformed into a printing surface similar to stereotype. The mode of preparing the phosphatic acid is described.

Two presses are described. The first is a hand press for printing from flat plates, consisting of a driving roller below the bed of the press turned by hand, and a pressing cylinder above it. An endless web of silk passes round the latter, and a roller immediately above it. A handle attached to a screw under a spring which supports the driving roller is moved through a short arc to exert pressure, the position of the handle indicating "the proper pres- " sure for printing and that for transferring."

The second is a "single-acting power printing press," consisting of an iron cylinder carrying the prepared zinc plate, and surrounded by a double set of washing and inking apparatus. The washing apparatus consists of washing rollers and washing rubbers preferably composed of linen twisted like a rope; for the latter it is laid into the surface in parallel lines; for the former it is worked round the cylinder helically. The washing rollers revolve at double the circumferential velocity of and in the same direction as the printing surface, and are damped by contact with trough rollers. The washing rollers and rubbers have endwise motions in contrary directions, thus producing on the plate a compound washing similar to hand washing. The inking apparatus is very similar, consisting of an ink trough, a "wandering" (vibrating) roller, a distributing and two or more inking rollers, the ink in each "system" increasing in consistency.

The paper is placed on a moveable table, where it is retained by a catch lever until the latter is lifted by a pin on a moveable segment with a cam, which acts on a second lever carrying a feeding roller. On this lifting of the catch lever the table is released and drawn towards the feeding roller by a weight, directly after which the feeding roller is pressed into contact with the paper between an endless cloth roller and ribbons on the other side. At the same moment a register pin and lever is pressed up, and allows the tapes and endless cloth of strong silk to draw the sheet forward. The action of the segment cam at this moment draws the table back for a fresh sheet. The impression is given by a roller above the printing surface, the former being "driven by contact "only;" or endless paper may be used.

By a Memorandum of Alteration, dated 6th December 1844, the title, which originally stood "Improvements in producing "designs and copies, and in multiplying impressions either of "printed or written surfaces," was altered to that given above.

[Printed, with Memorandum of Alteration, 2*s.* 2*d.* Drawings.]

A.D. 1844, July 3.—N° 10,240.

LORIMIER, ANTHONY.—"Improvements in the apparatus and "means of facilitating drawing from nature or models." A sheet or plane of strong paper, parchment, or other suitable substance, or "a skin plate of rolled and flattened metal" is per- "forated with from "two thousand to five thousand punctures "in each square inch." The punctured plane, by preference of about twelve inches in length by about nine in width, together with a thin plate of glass as a support, is fixed in a rectangular frame jointed to an outer frame, the former frame being "in a "vertical position, or of any degree of inclination" which may be convenient. The elevation of the lower edge of the plane should be of such a height as shall set the middle of the plane "at a convenient elevation for the eye of the operator in his "observation of the objects he intends to trace, the apparatus "being placed on a table of the usual height." A view of the object to be drawn will be obtained through the punctures with a distinctness sufficient to enable the operator to trace upon the surface of the plane "a linear representation of such object." To produce the most distinct view of the object, the eye should be "at a distance from the plane of about eighteen inches," and "some aiding support or resting place for the head" may be added if required.

[Printed, 10*d.* Drawing. See London Journal (*Newton's*), vol. 26 (*conjoined series*), p. 241.]

A.D. 1845, April 17.—Nº 10,625.

PIGGOTT, William Peter.—"Improvements in mathematical, "nautical, optical, and astronomical instruments, and in the "mode of manufacturing dials and other graduated plates." The first part of this invention consists "in the application of the "electrotype process" to the construction of graduated plates required for the instruments named in the title. A plate suitable for the intended purpose is engraved with "such graduations and "figures or designs as may be necessary." Then a matrix or mould "of a composition of wax" being prepared, "any number "of similar plates in copper or other suitable metal capable of "being deposited by means of the electrotype process" may be obtained. Or a mould "may be made in copper from the "original engraved plate" by the electrotype process, and from it "almost any number of plates may with care be obtained." The plates thus produced are finished by silvering.

The second part relates to rendering the compass box (containing the magnetic needle) "free from any magnetic attraction by means of the electrotype process.

[Printed, 4*d.* No Drawings. See Repertory of Arts, vol. 7 (*enlarged series*), p. 239; London Journal (*Newton's*), vol. 27 (*conjoined series*), p. 338; Engineers' and Architects' Journal, vol. 8, p. 358.]

A.D. 1845, December 10.—Nº 11,000. (* *)

POOLE, Moses. — (*A communication.*) — "Improvements in "apparatus to be used for drawing or marking." "The inven-"tion relates to a mode of constructing and arranging blades" for sharpening drawing and marking materials. The lead or chalk, with one end in a short tube, is moved up and down by means of a button, which works in a slot in the holder. When the lead or chalk requires pointing, a small case containing a series of small sharp steel blades is screwed on to the open end of the holder; the lead or chalk is thrust "among the interior "of the blades," and a "moving of rotation" gives the required degree of fineness. "The blades may be arranged in separate "cases made of wood, silver, or any other material," or combined with the holder.

[Printed, 6*d*. Drawing. See Patent Journal, vol. 1, p. 61.]

A.D. 1846, January 12.—Nº 11,031.

CHINNOCK, CHARLES.—"Improvements in the construction "and methods of extending and compressing articles of furniture "and domestic use, also applicable to cutlery, workmen's tools, "window blinds, shutters, and similar useful purposes." The patentee divides his improvements into "thirteen heads or claims," of which the eighth is "the construction of portable and other "easels." One part shuts into another "like a telescope," and the apparatus for fixing it for use "can be contained in a hollow "formed in the base."

The principal parts are a wooden base or block, two pillars (one sliding in the other), and a desk. At the lower end of the base is a contrivance for attaching the easel to any article of furniture; this can be turned up "into the hollowed-out part of the base" when the easel is not in use. The top of the base and the bottom of the hollow pillar "form a knuckle joint," and the easel may be fixed at any inclination by aid of a screw (which passes through the base) and a toothed quadrant at the bottom of the pillar. The height is regulated by means of a spiral spring inside the hollow pillar, a slot "with a rack on the outside," and a catch. The desk is attached by means of a tube (at one side) which slides on the upper pillar and is held in position by a "thumb nut and "screw;" another mode of attachment is described.

"An easel much less complex in its construction:"—A hollow tube carries inside it a pillar having "a groove running nearly "from end to end, into which a pin is passed through the outer "tube." To the top of the pillar is fixed a ferrule, having hinged to it a "brass slide piece, which fits into a dovetailed groove at "the bottom" of the desk and "allows it to move backward and "forward." When out of use, "the pillar is forced down, the "tube and the reading desk folded," and the easel is thus made very portable. This easel is fastened to any article by means of a sort of clamp and a screw.

[Printed, 3*s*. Drawings.]

A.D. 1846, July 23.—N° 11,306. (* *)

CREASE, Harold. — "Improvements in the preparation of "paints and colors for decorative and other similar purposes." The improvements consist in combining shell-lac, gelatine, and animal or vegetable oil with an alkaline base. The compound when amalgamated with ordinary pigments produces a paint, "which is free from offensive smell, and which will be sufficiently "dry within one hour to admit of another coat being laid on."

Add about 5 quarts of water to 2½ lbs. of well bleached shell-lac and ½ lb. of borax or "other suitable alkaline base;" boil or simmer until the ingredients are dissolved, and until the solution is reduced to about 1 gallon. Add to 1 quart of the solution from ½ to 1 pint of pure gelatine and 4 drachms of alcohol; allow the mixture to get well dissolved "and incorporated by degrees "by subjecting it to a slight elevation of temperature." Mix this last compound with the remainder of the solution, a sufficient quantity of white lead to give it a body, and a small quantity of well bleached oil, in the proportion of 7 lbs. of white lead, 2 ounces of oil, and 1 quart of the solution. Grind the whole, thin with a solution of shell-lac, and the paint will be ready for use.

The foregoing preparation is applicable to all paints, pigments, and colours necessary to artists and painters, "with the exception "of a few pigments which are impregnated with iron," in combination with all other substances as a base.

[Printed, 4*d*. No Drawings. See London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 35; Patent Journal, vol. 2, p. 606; Engineers' and Architects' Journal, vol. 10, p. 88.]

A.D. 1847, March 10.—N° 11616.

MURDOCH, James.—(*A communication.*)—"An improved mode "of preparing and employing certain colors and materials for "painting." The inventor, who obtained Letters Patent (sealed on February 11th, 1846) for "a mode of manufacturing oxide of "zinc," alludes to "the fatal rapidity with which pictures painted "in oil become changed," his grief "at the thought that master-"pieces of the greatest artists must after a time lose their fresh-"ness and their primitive colors," and the circumstances "that "the principal substances in the scale of the tones of painting "at present employed are violent poisons." He afterwards describes the following processes for manufacturing on a large scale zinc yellow, barytes yellow, antimony red, and zinc green," also "a new dryer."

Zinc yellow:—Three operations are required; the first gives a "marigold yellow," the second a "lemon yellow," and the third "a product which partakes of the two former tints but of a "paler tone." To prepare the first, 125 lbs. of bichromate of potass are dissolved in from 700 to 800 lbs. of water heated in a copper boiler, when there are poured in about 60 lbs. of white of zinc "previously diluted in water to a clear cream and passed "through a sieve." The mixture is left to stand from 24 to 36 hours (taking care to stir it frequently during that time) "in "wooden vats lined with zinc;" it is then returned to the boiler and "boiled for an hour, after which it is poured again into the vats, allowed to settle, "and the precipitate being collected is "washed, set to dry, and made up into cakes."

Lemon tint:—"The decanted water resulting from the pre- "ceding operations as well as the water of the first washing are "heated together in a boiler, and a solution of sulphate of zinc "is poured therein." This solution is made by mixing about 75 lbs. of oxide of zinc diluted with water and passed through a sieve with 44 lbs. of the sulphuric acid of commerce of the strength of about 65½°. The mixture is boiled for about an hour, is then put into vessels lined with zinc, and is allowed to settle therein; the deposit is collected, washed, left to dry, and made up into cakes.

The pale tint:—"The decanted water from the second operation, "as also the first washings from the two former operations, are "put together into the boiler," and sulphate of zinc, composed of 15 lbs. of oxide of zinc and 7 lbs. of sulphuric acid of commerce, is poured in; the mixture is boiled and subjected to the operations before described.

Barytes yellow:—"Into a solution of chloruret of barium free "from iron pour a solution of the double chromate of potass and "soda, until there is no further precipitate, wash the product "and dry it by a stove." The proportions are 100 lbs. of chloruret to 82 or 84 lbs. of the double neutral chromate of potass and soda.

Orange red—sulphuret of antimony:—"Natural sulphuret of "antimony, reduced to powder and as free as possible from lead, "is exposed in earthen vessels to the action of hydrochloric acid,

" purified from lead and assisted by heat. The addition of acid " is continued until the whole of the sulphuret is dissolved." The liquor "is decanted into earthen or wooden vessels pierced " with holes at different heights;" its strength is ascertained, " and by the addition of water or acid it is brought to mark by " the common French ariometre 13° to 17° according to the " shades required." The liquor is put into suitable vessels, " and " a current of hydrosulphuric acid is passed through it, which " produces the orange red of antimony." The liquor should be frequently stirred, and the vessel in which the action is going on "should be kept covered, or a communication should be " established between several, so as not to allow the sulphuretted " hydrogen to escape." When there is an excess of sulphuretted hydrogen in the vessels, " the current of gas is suspended, the " precipitate of the sulphuret of antimony which is formed is " allowed to settle and is washed by decantations several times; " it is then spread upon cloths and washed thoroughly until the " water runs off tasteless," when it is dried at a gentle heat not exceeding 100° to 120° Fahrenheit.

Zinc green:—" A hot solution " of 49 lbs. of pure and dry sulphate of cobalt is poured upon 245 lbs. of oxide of zinc slacked with as little water as possible; when thoroughly mixed by stirring, it is dried and " calcined for about three hours in a " muffle furnace heated to bright red;" it is then left to cool a little, thrown into water, washed, and dried.

The drier is composed of a metallic peroxide, by preference the peroxide of manganese, combined with linseed oil. Boil purified linseed oil 6 to 8 hours, and then to 200 lbs. weight of the boiled oil add 10 lbs. of the peroxide of manganese of commerce pounded, and by preference in a powdered state. Boil the mixture 5 to 6 hours, taking care to stir it to prevent the oil from " becoming carbonised at the bottom of the vessel, and the " manganese sticking to the bottom, unless the latter substance " is placed in a bag." The manganesed oil is allowed to cool and is then filtered. This drier is added to the colour prepared with the zinc white, "the proportions varying from $\frac{1}{10}$ to $\frac{1}{20}$ of " the weight of the preparation." It is preferable, " in order to " obtain a more thorough mixture to mix the manganesed oil " with the white of zinc in grinding the latter, the proportion " being $\frac{1}{10}$ to $\frac{1}{25}$ of the weight of oil."

Compound colours are obtained by combining the above described "with colours before in use taken from those which "contain neither lead nor copper."

The inventor employs his improved colours also in "polished "painting" and in painting paperhangings.

[Printed, 6*d*. No Drawings. See Patent Journal, vol. 3, p. 432; Engineers' and Architects' Journal, vol. 10, p. 354.]

A.D. 1847, July 10.—N° 11,789. (* *)

STOKES, Samuel.—"An improved machine for tracing or "engraving from solid bodies or subjects in relief."

This machine consists of three parts; (1) A framework or stand fitted with a universal joint, and carrying a long hollow bar; (2) A "secting and dividing apparatus," which determines the plane in which a "tracing blade" moves. This apparatus consists of an arrangement of cones, with centres or axes, universal joints, and balance weights, which have rising and falling motions on a prism-shaped standard; (3) A sliding rod carrying the tracing blade and moving in the hollow bar, through which bar the line of projection of the instrument is determined. The sliding rod is moved by the hand of the operator against the surface of the solid body or subject in relief. The required engraving is produced by a diamond point on a fixed plane opposite to, and at a distance from, the tracing blade.

[Printed, 10*d*. Drawing. See Patent Journal, vol. 4, p. 200.]

A.D. 1848, December 9.—N° 12,361.

TAIT, William Ironside.—"An improved method or methods "of producing outlines on paper, pasteboard, parchment, papier "mâché, and other like fabrics." The patentee divides his invention into fourteen parts, the last of which is "the production of "dotted and continuous outlines to the producing generally of "outlines of all objects that may be made the subject of lineal "representation, and a knowledge of which, or skill in delineating which, may be promoted by means of such outlines, as "for example, the human figure, statues, buildings," &c.

Dotted outlines are obtained by pasting a copy of the drawing "upon a well planished and thin plate of some soft metal," by pricking the copy through at every point thought advisable "with such force as to raise a burr" on the surface of the metal plate, and by afterwards taking impressions on paper or any of the aforesaid fabrics by means of a copper-plate or other suitable press. The impressions of the punctures may be coloured by placing a sheet saturated with the desired colour "between the " punctured plate while it is in the course of being printed from, " and the paper (or other material) which receives the impression." Or plates of metal may be punctured "without the superposition " of any copy." Or a cylinder press may be employed, "to " which the punctured plate is bent and fitted."

Continuous outlines are produced by engraving upon plates of metal in the usual way, "and taking dry impressions thereof" on paper or other fabric by means of pressure. A machine for imprinting continuous lines is described; it is composed principally of an endless web of cloth which revolves on two cylinders, a series of cords for keeping the paper, &c. in place, and a block of india-rubber in which are inserted a number of "dull-pointed " needles" at equal distances, "and inclined a little in the opposite direction to that in which the web revolves." Or thin plates of metal, sheets of cardboard, &c., are cut through in suitable lines, "and thus form guide frames" for pen or pencil. Or lines may be made in the paper "after the manner of the " ordinary trade watermarks." Or colored lines may be produced by employing "a set of rollers similar to the inking rollers of a " printing machine mounted immediately over the dandy roller."

[Printed, 8*d*. Drawing. See Mechanics' Magazine, vol. 50, p. 571.]

A.D. 1848, December 21.—N° 12,383. (* *)

RIDDLE, William.—" Improvements in the construction of " ever-pointed pencils, writing and drawing instruments, and in " inkstands or inkholders."

1st. Providing for the use of several leads in one ever-pointed pencil, one after another, without the necessity of removing the point or handling the lead at each renewal. A chamber, connected with a volute and spring, contains the leads; rotating the pencil case brings into use and propels the leads or other marking material.

2nd. Grooving the stem of a wooden ever-pointed pencil, so that a propeller with a helical thread can push the material out of the point.

3rd. The ink is retained in metal pens by means of a shield attached to the pen by a tightly-fitting pin joint, which enables the shield to be turned back for cleaning.

4th. A strip is advanced or withdrawn from the nibs of gold pens by a screw movement, making them hard or soft.

5th. Applying the principle of the 4th improvement to ordinary penholders.

6th. A strip of metal is slid under "the cross pins" in the inner tube of a Bramah or of "the universal" penholder, so as to form a cavity in the hollow of the pen, and cause it to take up an extra amount of ink.

7th. Attaching the covers of inkstands, so that the same power which keeps them closed shall hold them open during use. A helical spring and stud are used in connection with a jointed cover.

8th. Applying perforated metal, wire gauze, horsehair, &c., as a filtering medium to inkholders for the purpose of removing any accumulation of dust or dirt.

9th. Silvering the insides of glass inkstands, so as, when filled with ink, to resemble mirrors on the outside. A mixture of lunar caustic, spirits of hartshorn, spirits of wine, and oil of cassia, is used for this purpose.

[Printed, 1*s*. Drawings. See Mechanics' Magazine, vol. 50, p. 619; Patent Journal, vol. 7, p. 137.]

A.D. 1849, July 4.—Nº 12,691. (* *)

THOMSON, ROBERT WILLIAM.—"Improvements in writing "and drawing instruments."

In a pen made wholly of glass, a piece of capillary tube has a bulb blown upon it at one end; the extremity of the bulb is "drawn off into a curved form suitable for the nib," the width of which and the opening therein determine the thickness of the stroke produced by the instrument when in use. The bulb may be filled with ink or colour by the suction of the mouth. Or a short tube, fitting tightly over the stem of the pen by means of a vulcanized india-rubber collar or an india-rubber extension, may be drawn off the stem, causing the rise of the ink when the upper end of the tube is closed. Or the bulb may fit into the elastic collar of a metal stem by means of a short shank; the pulling up of a piston that fits the hollow stem, fills the bulb; this instrument may have a moveable stem for the pocket.

The points and nibs may be made of precious stones, and cemented to the glass bulbs. Glass and stone nibs may be attached to metal bulbs. "The nibs may be preserved by deposit-" ing on them a coating of metal by the electrotyping process, " and ground into shape with the nib."

Another improvement consists of "an arrangement for giving " elasticity to common metal penholders." In one instance the short tubular holder has a shank inserted into it, and held fast by a vulcanized india-rubber collar inserted within the ordinary holder. In a second instance, a vulcanized caoutchouc plug is fastened into the tube, so that the lower end of the plug is free.

[Printed, 6*d*. Drawing. See London Journal (*Newton's*), vol. 37 (*conjoined series*), p. 79; Mechanics' Magazine, vol. 52, p. 37; Patent Journal, vol. 8, p. 187.]

A.D. 1850, January 3.—Nº 12,913. (* *)

WATERLOW, ALBERT CRAKELL.—(*A communication.*)—"Im-" provements in the means and apparatus for obtaining copies " of writings, drawings, and other designs." "The invention " consists of modes of arranging apparatus, by means of which " copies of writings, such as letters and other documents, and " by which also impressions from stone or plate of drawings or " other designs, in like manner to which lithographic drawings " and designs are now produced, may be obtained." A damp sheet of paper is laid over the subject to be copied, and the copy is taken by drawing over it a frame containing either a pressing cylinder in spring bearings or a scraper bar. When the subject is on paper, the damp sheet is covered with a sheet of felt.

In a modification of the apparatus employed, the stone or plate is on a bed, which, by means of a rack, is passed between two cylinders.

"An arrangement of a very simple nature for obtaining copies " according to lithographic or zincographic process" is described. This last apparatus is portable, and a box to hold it is shown in the Drawings.

[Printed, 1*s*. 4*d*. Drawings. See Repertory of Arts, vol. 16 (*enlarged series*), p. 80; London Journal (*Newton's*), vol. 38 (*conjoined series*), p. 24; Mechanics' Magazine, vol. 53, p. 18; Practical Mechanics' Journal, vol. 3, p. 175; Patent Journal, vol. 9, p. 176.]

A.D. 1850, June 24.—N° 13,151.

MITCHELL, Edward. — "Improvements in fastenings for "articles used for writing, and drawing, and other purposes, and "improvements in articles to be used for writing and drawing." This invention relates to penholders, pens, inkstands, book-clasps, paper-fasteners, and "wrist and other bands;" the improvements consist in the methods of fastening parts of such articles together.

The first five figures in the annexed sheets of drawings show the improvement "in fastenings for pens used for writing and "drawing." A button is fixed on the interior of the penholder, or an equivalent is "punched in the metal of the holder." The pen has cut in it a slot with a round head. The head passes over the button, "and the smaller part of the slot fits the stem."

Sometimes the button or its equivalent is on the outside of the holder; sometimes the slot is cut in the holder, and the button is fixed on the pen or punched out of it.

The pen is made with a hole or slot at the upper end of the slit. Two slits meet together a little above the shoulders, "but "do not cut through the edge of the metal below the shoulders," so that there will be an elasticity at the parts near the nibs.

[Printed, 1*s.* 2*d.* Drawings. See Mechanics' Magazine, vol. 53, p. 518; Patent Journal, vol. 10, p. 166.]

A.D. 1851, August 23.—N° 13,726.

PALMER, James.—"Improvements in delineating objects, and "in apparatus and materials for that purpose." The objects are delineated "on sheets of glass or gelatine placed between the "object and the eye of the operator." The apparatus is composed of (1) two upright pillars fixed in a base and strengthened by struts; each pillar has a projecting ledge against which a plate of glass is placed and supported by "a cross bar capable of being "raised and lowered and fixed at any required height by means "of small bolts or catches which enter racks in the sides of the "pillars." The glass is confined by slides or buttons and wedges of wood or cork. (2) two light bars or metallic tubes sliding in sockets which slide up and down upon dovetailed pieces of metal attached to the pillars; (3) a cross bar fixed to the light bars and carrying a sliding frame by preference "of the form of the frame "of a pair of spectacles." Each aperture of the frame is fitted with a moveable plate or shutter, and "magnifying and diminishing glasses are also fitted to the spectacle frame to adapt " the apparatus for the use of long-sighted and short-sighted " persons."

In using this apparatus the parts are so adjusted that the artist by applying his eye to the open aperture of the spectacle frame can see the object through the glass. " He then proceeds to trace " over on the glass all the principal lines of the object, using for " this purpose the pencils herein-after described." The shading may be finished while the glass remains in the apparatus or after it is taken out; or the shading may be done on paper "which is " then fixed behind the glass." Sometimes the outline is drawn on one side of the glass and the shading on the other; in this case "a fine effect is produced by slightly grinding or roughening " the back," and "applying the shading and colour to this " roughened surface." Directions are given for transferring the drawing to paper, for obtaining " right and left-handed drawings " and for cleaning and drying the glass."

If gelatine is used, a sheet thereof is attached to a plate of glass and drawn upon with the aforesaid pencils or scratched with etching needles; or "a quantity of melted gelatine may be poured " upon a sheet of glass placed in a horizontal position and allowed " to cool and harden." Directions also are given for applying these drawings or etchings to "printing in the style of copper-plate printing," and for transferring them to lithographic stones, wooden or metal blocks, zinc, copper or steel plates.

For the better delineation of "a vase or bust, or any other " small object," there are added to the apparatus two bars which support a board or table; these slide in sockets that can be raised, lowered, and fixed on the dovetailed pieces attached to the pillars. The whole apparatus may be put together with thumb-screws or hooks so as to be readily taken to pieces.

In taking portraits with this apparatus, it is necessary that the head of the sitter be kept as immovable as possible; a vertical pillar is fixed in a base and is supported by struts; up and down the pillar slides a socket carrying a bar, at the end of which is a cap or cage for the head to rest in.

A portable apparatus:—A frame is fixed on a tripod stand by means of a screw; an inner frame, in which the glass is secured, carries bolts or catches which enter two racks in the outer frame and serve to hold the glass at different heights; two bars sliding in sockets carry the spectacle frame, and the apparatus is steadied by rods or struts.

An apparatus to be used on a table:—This is composed of (1) a frame having on each side a ledge, a rack, and a bolt or button; (2) a cross bar provided with bolts or catches which enter the racks; the glass rests on this bar and is kept in contact with the ledges by means of wedges acting against the buttons; (3) two bars hinged to the frame and carrying two struts (also hinged to the frame) so that the bars and struts "may fold flat upon the "back of the frame," and a bar fastened to the two bars by thumb-screws or hooks to keep them extended; (4) bars sliding in sockets and carrying the spectacle frame. The outer frame "is "made to descend below the edge of the table" against which it rests, and a weight is placed on the extending bar to steady the apparatus.

Instructions are given for varying the size of a drawing, so that it may be "smaller than the object itself;" but "to obtain a de-"lineation larger than the natural size of the object" an apparatus is employed "constructed on the same principle as that employed "for the magic lanthorn or for the oxyhydrogen microscope." It consists of (1) a wooden box having a door at one side and another at the top; in the middle of the latter is an opening closed by a lid; (2) an argand or other lamp placed on a stand; the chimney passes through the opening; (3) two convex glass lenses "for collecting the light" and "throwing it on the drawing or "engraving which is to be magnified;" (4) two "concavo-convex "lenses" fixed in a tube which is moved by a rack and pinion so as to adjust the focus; (5) a glass screen finely ground on both sides and an apparatus similar to one of those before described, and "placed on the opposite side of the glass." The magnified image is employed in lieu of the object itself; it may be drawn on the glass screen and afterwards transferred, or it may be traced with an etching needle on a sheet of gelatine fixed on the screen.

The "basis for all the pencils" is 1 oz. of shellac reduced to powder and melted with 8 oz. of white or other wax and 8 oz. of soap; the whole is carefully heated and stirred "until thoroughly "incorporated together;" it may be hardened by adding more shellac, or softened by the addition of soap. The colours "are "produced by mixing various colouring materials with the above-"mentioned composition."

The patentee claims also a "mode or modes of preparing in-"soluble gelatine:"—8 oz. of alum, 8 oz. of acetate of lead, and 8 oz. of borax are dissolved and mixed with 1 gallon of water. " A white precipitate is formed, which is allowed to subside, and " the clear liquor is drawn off, and if necessary filtered." Sheets of gelatine or sheets of glass coated with gelatine are immersed into this clear solution and are left in it for about 12 hours; they are then taken out and allowed to dry, when they are fit for use. The sheets are kept flat by being stretched between two frames. Various substitutes for the above-named ingredients, a mode of staining or colouring insoluble gelatine, and a process for copying etchings made on insoluble gelatine are mentioned in the specification.

[Printed, 1*s.* 4*d.* Drawings. See Mechanics' Magazine, vol. 56, p. 197; Engineers' and Architects' Journal, vol. 15, p. 111.]

A.D. 1852, January 12.—N° 13,894.

DUTHOIT, ALCIDE MARCELLIN.—"An improved chemical " combination of certain agents for obtaining a new plastic pro-" duct." The patentee applies his invention to a variety of purposes, amongst which he mentions "manikins, called plastic " manikins, all the different anatomic pieces of which, when " made with my mastic, are susceptible of being taken to pieces " and put up again with great facility." He also employs his coloured mastic as a liquid paint by redissolving it "in purified " and rectified naptha or benzole."

The plastic product is a combination of "common oxide of " zinc, purified oxide of zinc, or colored oxide of zinc, amianthus, " fusible spar or sulphate of barytes, and other analogous sub-" stances, and mineral and vegetable colours, with purified and " bleached gutta percha;" the colours are used "in a state of " impalpable powder."

He describes "three compositions":—1. To one part of gutta percha he adds one part in weight of either common oxide or purified oxide of zinc; the quantity of zinc however varies " according to the quality and intended application of the mastic."

2. To one part of gutta percha he adds, "according to the " quantity, the use, the solidity, or the intended application of " the mastic," a smaller, greater, or equal quantity of fusible spar.

3. He adds to one part of gutta percha, a smaller, greater, or equal quantity of amianthus "in a state of fine powder or in de-" coction;" but before mixing the two together he makes "a " strong decoction of amianthus, in the proportion of twenty " parts of purified and rectified naptha or benzole to every part of " amianthus;" this he decants and mixes with the gutta percha. To give elasticity for certain applications he dissolves one part of caoutchouc in from "one to twenty parts of the said solution." Great care must be taken "in filtering for the above solution; a " heat of twenty-five to thirty degrees centigrade is necessary " during several days."

The "mode of operating" is detailed, and there is a long list of the articles which may be made from the compositions.

[Printed, 4*d*. No Drawings. See Mechanics' Magazine, vol. 57, p. 59.]

A.D. 1852, February 12.—Nº 13,969.

BARBÉ, Charles Louis.—" Improvements in the reproducing " of drawings and in the mode of obtaining designs."

[No Specification enrolled.]

A.D. 1852, September 23.—Nº 14,302.

TARDIEU, Jacques Léon.—" Improvements in the colouring " of photographical images," "without destroying or affecting the " beautiful delicacy of the lines and shades." The patentee gives to his process the name of "Tardeschromy." Having obtained a photograph on paper or other substance "naturally transparent or " susceptible of being so rendered by imbibing it with a varnish " or by any other means," he fixes the edges of the paper to a frame, applies several coats of varnish on one or both sides, and leaves it to dry. The paper may be stuck on a sheet of glass or other substance sufficiently transparent; in this case he lays on the glass "a coat of Venetian turpentine or of very thick varnish" and presses on it the paper "on the side of the positive image," causing it to adhere without wrinkling. If the paper is too thick to have sufficient transparency, he wets it on its surface, wears it down until it becomes sufficiently thin, and then gives it a coat of varnish. If the positive is obtained directly on glass, varnish is not required.

The colours preferred "are the same as those used for oil paint-" ing;" if other colours are employed, "several coats of any "suitable varnish" are passed over them. "The colours are to "be laid on the *back* of the image instead of on the front."

"Final operation for the preservation of the images":—He glues on the colour "one or several sheets of paper or a piece of "thin tissue or any other kind of suitable fabric;" or he glues the coloured photograph "on a sheet of pasteboard, wood, metal, or "other suitable substance of slight thickness." If the photograph is to be stuck on cloth or canvas, this "may be first fixed to the "frame and covered with paint in the same manner as canvas for "painting, and then the image may be glued on." The whole is placed between two or more sheets of paper and made to bear a suitable pressure for about an hour, after which the edges are pared off, and "one or two coats of varnish used for oil paintings" are passed over the surface.

[Printed, 4*d*. No Drawings. See Mechanics' Magazine, vol. 58, p. 296.]

PATENT LAW AMENDMENT ACT, 1852.

1853.

A.D. 1853, January 10.—N° 61.

HIRON, Antoine.—(*Provisional protection only.*)—"Improve-"ments in the means of copying or reproducing models or figures "in marble, stone, ivory, or other substances." The first part of this invention relates to "the copying of any sculpture or other "work of art, the same size as the model;" the second to "pro-"ducing a reverse or counterpart of the object to be copied;" and the third to "copying a sculpture or other work of art of an in-"creased or reduced size." The description given of the machines for carrying out the invention is very scanty, the inventor referring the reader to his drawings for information.

1. The model and the block of marble or other material are placed on iron plates on a horizontal platform. A drill is attached

to one end of a moving frame and a guide to the other; the drill "by the motion of the frame will cut off the marble as the frame "advances and will not cut any more when the guide comes in "contact with the model." The frame has its motion round an axis; it is maintained in position by a screw, and is set in motion by means of pulleys.

2. The drill is placed at the right and the guide at the left angle of a parallel motion; at the top and bottom angles are sockets which move up and down a vertical shaft; the bottom socket is kept in its proper position by a screw. One drawing shews an arrangement "to give strength" and prevent oscillation.

3. The platform is inclined, and to obtain a larger copy the model is placed on the upper plate, and for a smaller copy on the lower plate. "By having as many drills as convenient, as many "copies can be produced, and in different proportions, each being "smaller as it is placed nearer the axis." The drawings for this part shew a weighted lever "from which the drills and guides are "suspended;" "the disposition of the pullies, and the axis that "supports it, to enable the pieces to which the drill is attached "to have up and down motion;" the drill bearer, "shewing the "working of the pinions putting the drill in motion;" and the guide bearer.

[Printed, 8*d.* Drawings.]

A.D. 1853, January 29.—N° 232. (* *)

ARCHIBALD, Charles Dickson.—(*A communication from Charles Gordon.*)—(*Provisional protection not allowed.*)—"An "improved goniometric protractor or instrument for setting out "and measuring angles and other geometric figures."

The invention states that the "instrument consists of a combination of six parallel motions together with a circle or semicircle and parallel rule."

[Printed, 4*d.* No Drawings.]

A.D. 1853, February 5.—N° 320.

WHITEHOUSE, John, the elder, and WHITEHOUSE, John, the younger.—"Improvements in the manufacture of knobs for "doors and other like uses, part of which improvements is applicable to the manufacture of certain articles of earthenware," among which are mentioned "artists' color pans." These articles are made "from earthy materials pulverized," instead of from such materials in a plastic state. The apparatus required consists of (1) a bed plate, (2) a mould box clamped or bolted to the bed plate, (3) a die with "moveable parts," which "can be raised in "their holes or sockets in the die," (4) a moveable plate at the bottom of the mould box and having on its under side a rod whereby it may be moved up and down vertically in the box, and (5) a fly press or other pressing apparatus.

The process of making a pan is as follows:—The moveable parts are raised in their sockets, and the mould box is filled with pulverized material. The parts are raised up in order that there may be on them "only about half the quantity of material" that there is on the other portions of the die. The piston of the press is lowered, the moveable parts descend, and the whole of the material is submitted "to one uniform pressure, or nearly so." The piston is then withdrawn, and the die is pushed up by the plate by means of the rod, when the completed pan may be taken away.

[Printed, 1*s*. Drawings.]

1853, February 17.—N° 416.

GORDON, Charles.—(*Provisional protection only.*)—An improved "goniometric protractor, or instrument for setting out and "measuring angles and other geometric figures." A meridian, having "a parallel movement at right angles either north or "south," is secured to a base by clamps. The meridian at its other end has attached to it a parallel ruler, whose lower limb carries "a fixed semicircle inverted with the proper sub-divisions "of degrees laid down, which acts upon a vernier" affixed to the meridian. The mode of attachment between the meridian and the base is such as to form "a combination susceptible of six "distinct parallel movements," all of which the inventor claims as his "true original invention."

[Printed, 6*d*. Drawing.]

A.D. 1853, March 21.—N° 695.

BRETT, John.—(*Provisional protection only.*)—"An improved "portable sketching apparatus for artists." A camp stool has two of its legs so arranged as to form between them a compartment for the reception of a drawer which serves to hold a palette, sketch book, &c. When the drawer is slid out, it forms an easel, at the side of which are hinged rests to support the drawing or sketch book. At the lower part of the drawer is a trough or dish (divided into compartments) for colours, also a case for pencils, crayons, brushes, knife, &c. The colour-dish "is made to shut "in and the case to fold up when not in use," and the dish "may "be removed from the compartment," and "fixed on to the "palette." The seat of the stool "falls over the opening of the "compartment which holds the easel, so as to form a protection "against wet."

[Printed, 4*d*. No Drawings.]

A.D. 1853, April 9.—N° 857.

TAYLOR, HERBERT.—(*A communication.*)—"Improvements in "ornamenting surfaces or fabrics applicable to various useful "purposes, such as for covers of furniture, imitation tapestry, "carpets, or hangings." This invention comprises (1) painting by hand upon cloth previously prepared with a mordant "that "will combine chemically with the colors laid on one over "another," and (2) "developing and fixing permanently the "colors by steam."

The cloth, being first perfectly bleached with soap and sulphur, is put into a mordant composed of hydrochloric acid, sulphuric acid, and block tin, in about the proportion of 18 lbs. of the first, 9 lbs. of the second, and 2½ lbs. of the third, "the whole "being warmed in a sand bath, during which chlorine gas is to "be introduced" to saturate the solution. When the cloth has remained in the mordant about three quarters of an hour, it is taken out, wrung out, and in about ten minutes after placed in a liquid "prepared with twenty parts cold water to one part of "clear chloride of lime water, at two and a half degrees Beaumé;" after an immersion of about three minutes it is washed in clean water and dried.

"The primitive colors" employed are "chiefly vegetable," but "some mineral and some animal colors" may be used. The picture should be begun with the lighter shades and finished with the darker ones, allowing each color to dry before another is put over it. "The most expeditious and economical manner of "putting on the figures or designs is to have the outline, or so "much of the figure as may be necessary, lithographed and "stuck on to the cloth."

2. The painted cloth is "rolled in a damp cloth or laid between "*damp* cloths to soften and moisten it." Each piece is then

" separately rolled in a clean white cloth, and suspended in a " steam chamber, so that the rolls shall not touch each other or " the sides of the chamber." The chamber being tightly closed, steam is let in, and the rolls remain therein from forty-five to ninety minutes, according to their size. If more than one steaming is required, the rolls "should be turned upside down" to prevent the colors from running. After steaming, the cloths are dried by exposure to the air for about twenty-four hours; they are then put into clear water until the gum in them dissolves, then "dipped up and down in the water until the color " ceases to run," then rolled in clean white towels and beaten " to drive out the water," and (when "the excess of coloring " matter" is entirely washed out) brushed lightly with the grain of the cloth, covered with white paper, and ironed with a moderately hot iron.

[Printed, 6*d*. No Drawings.]

A.D. 1853, July 15.—N° 1693. (* *)

GOODYEAR, Charles.—" Improvements in the manufacture " of pens, pencils, and instruments used when writing, marking, " and drawing." The material of which the articles are made is india-rubber kneaded with sulphur, "or matters which contain or " will give off sulphur when subjected to heat;" the proportions are "two parts by weight of india-rubber and one part by weight " of sulphur." For pens the compound is rolled out into a thin sheet of the thickness of a strong quill, and is cut up into suitably narrow strips; these are (by preference) placed between two surfaces of glass, the one concave, the other convex, and subjected to heat for about six hours. The patentee finds "that the best " means of applying the heat is by means of a bath of water." The temperature is gradually raised, "say to 230° of Fahrenheit " in about half-an-hour, and at this temperatue the heat is to " remain for about one and a half hours; the heat is then again " to be raised gradually to about 295° to 350° of Fahrenheit during " the remainder of six hours, when the compound and the glass " moulds or surfaces are to be removed and allowed to cool." The strips are then taken from the glass, cut into lengths, and made into pens, instruments being employed, "such as are used " for making pens out of parts of quills."

Slates are made by kneading " the powder of slate, or of porce- " lain for white slates," with the above compound, as much of the powder being introduced as it will take up "and yet retain a " plastic state, such as to admit of the same being rolled into a " sheet." The sheets are placed between flat plates of iron (with tin foil between) and subjected to heat as before described. If the compound is to be used for slate pencil, it is to be cut up into suitable forms.

[Printed, 4*d*. No Drawings.]

A.D. 1853, November 3.—N° 2552. (* *)

DUPPA, Bryan Edward.—" Improvements in coloring pho" tographic pictures."

These improvements "consist of rendering the front surfaces " transparent with suitable varnish, and applying colors to the " back surfaces, by which means the laying on of the colors will " not require that artistic skill heretofore necessary, and results " are obtained which cannot be obtained by the coloring on the " front surface."

A coating of wax, mastic, or other varnish is given to the front surface of a paper photograph; this process renders the paper transparent. Oil colours are then suitably applied to the back of the picture by means of a brush; the colour being applied uniformly (in most cases), the lights and shadows are entirely produced by those of the photographic picture itself. The back of the picture is then cemented on to a surface of white lead spread over cardboard, and, finally, the front of the picture is again varnished.

The image shown by the photographic picture may be reversed by colouring the "face" or front of the photograph, the paper being rendered transparent as explained above; "the photograph " image will then be seen through the paper, and the colours " through both."

[Printed, 4*d*. No Drawings.]

A.D. 1853, December 8.—N° 2856. (* *)

LAVERDET, Marcel Gustave.—(*Provisional protection only.*) —" An improved mode of treating photographic pictures."— " This invention relates to a mode of coloring photographic " pictures, so as to give them a life-like or natural appearance, " *without impairing* the exactitude of the photographic image, as

" is the case with the ordinary method of coloring, and without " requiring the manipulation of a skilful artist."

The photograph is rendered transparent " by coating the back " with varnish, and causing it to penetrate the pores of the fabric " containing the picture." When the varnish is dry, oil colours are laid on the back of the picture, " so as to imitate as closely as " possible the natural tint of the object represented."

" These colors may be diluted with rectified essence of turpentine so as to obtain the requisite tints, care being taken tc " saturate the paper, so that the color may penetrate through to " the other side."

" The picture is then allowed to dry, and is aftewards varnished on the front side. If the tones are not correct they may " be removed by means of essence of turpentine, and others laid " on without injuring either the picture or the paper."

" It is only now necessary to place the photographic picture " upon a white ground and the operation is complete."

[Printed, *4d.* No Drawings.]

A.D. 1853, December 9.—N° 2870. (* *)

MORLEY, GIDEON.—(*Provisional protection only.*)—" Ornamenting or producing pictures on japanned goods, pannels, " canvas, or other material, whereby a vast amount of artistic " skill and labour is superseded."

" The invention consists in first printing a sky or background " suitable for the subject intended to be produced;" and, next, printing in outline (on paper) from a copper or other plate, " the " intended subject in a suitable colour, the same to be transferred " on or below the sky or background before mentioned." The shadows and other parts of such outline pictures are next painted with transparent or suitable colours, when recourse is again had to " the process of printing and transferring, using " the same colour as employed in the first printing, but the " detail of the subject in this case must be fully defined." The body colours and high lights are then used in suitable places for giving effect, thus producing apparently a well finished painting.

[Printed, *4d.* No Drawings.]

1854.

A.D. 1854, March 1.—N° 500.

ROUSSEL, Simon.—" A new system of painting and colouring " glass, being an imitation of old and new church window " glasses, called typophanic." When the glass has been well cleaned, stripes are produced upon it by cutting it with hard bodies or by corroding it with fluoric acid. There is then laid on it size made from animal glue, gelatine, or dextrine, with the addition of some saccharine or mucilaginous substance; or it is covered with a varnish with which "a small quantity of salts or " chlorides" is mixed. "All the colors are prepared in the " same way." The design to be represented "is drawn on paper, " fibrous stuff, or on a metallic sheet, and the outlines being cut " out, they are set on the glass before the size or varnish is dry." These outlines represent "the connecting leads of the glass." Sheets of paper also or other materials are used, "on which the " same outlines are cut out," and the interstices are lightly coloured with a pencil. When the glass thus prepared is dried, the colours are laid on, and the glass is heated "to the temperature " of about 140° Faht."

"The diaphanous sculptures are the reproduction, by means of " moulds, of the designs on which the effects of light or shade " are produced by the degree of thickness of the substance " employed. The china plates called lythophania are the prototypes of these effects."

The invention includes the "manufacturing diaphanous plastic " products of every kind in gutta percha, beeswax, and other " wax, resinous matters, gluten, horny substances, horn plates " moulded by pressure or other similar means, colored in the " bulk of the glass, or made of two plates of different colors " superposed, or of designs colored after their manufacture;" also the "reproducing the transparent plastics by moulding the " glass or crystal or by employing more fusible glass composed " with metallic oxides."

[Printed, 4*d*. No Drawings.]

A.D. 1854, April 15.—N° 874. (* *)

GOODRICK, Charles Brutus.—(*Provisional protection only.*) —" An improved artizans' tool, which may be used as a measur-

" ing rule, straight edge, set square, T square, bevel, and plumb
" rule."

"The tool consists of two pieces, one longer than the other,
" and which in one position form a foot rule and straight edge,
" in another a set square; the shorter arm has a slot and hole
" cut in it, and a nick at top, from which a line is suspended,
" carrying at bottom a plumb lead which moves in the hole cut in
" the shorter arm. In another position this tool forms a T square,
" while it can also be made to form a bevel, set at any desired
" angle. The tool is fixed and made to assume any of the
" required forms by means of a washer and screw."

"By the addition of another length the tool may be converted
" into a two-feet as well as a one-foot rule."

[Printed, 4*d*. No Drawings.]

A.D. 1854, May 2.—N° 987.

DIÉ, GUILLAUME. — (*Provisional protection only.*) — " Improve-
" ments in the manufacture of tracing cloths and tracing paper."
The inventor makes a compound of the following ingredients and proportions by weight:—Lavender essence, 129 parts; gum copal, 264; spermaceti, 65; stearine, 31; boiled linseed or siccative oil, 58; Venetian turpentine, 129; solution of gutta percha in carbonic essence, 107; litharge, 22; common turpentine, 130; carbonate of soda, 65.

He dissolves the copal with the essence in a cast-iron vessel, heats the solution, and puts in first the spermaceti, then the stearine, then the Venetian turpentine, and then the oil. He heats the mixture, takes it off the fire, and adds the solution of gutta percha. He then dissolves the litharge in a small quantity of turpentine or sweet oil, mixes the ingredients together, and clears it with the turpentine. Finally he filters the compound and adds to it the soda.

Paper is to be dipped into the compound or to be sponged or brushed over with it, and then to be dried over a stove.

Woven fabrics are first to be calendered and immersed in a filtered solution of lichen, starch, and alum, and then to be "passed
" repeatedly through the compound"; the superfluous matter is to be scraped off, and the fabrics are to be calendered again.

[Printed, 4*d*. No Drawings.]

" 70 degrees Fahrenheit, for a period of four weeks at least to " dry; when so dried, the crayons or pencils may be placed in " cedar wood cases, or used tubular in the ordinary metallic " pencil cases."

[Printed, 4*d*. No Drawings.]

A.D. 1855, March 20.—Nº 627.

WILLIAMS, HENRY THOMAS. — (*Provisional protection only.*) An "improved method of making an easel." Pieces of mahogany, oak, or beech, are put together with thumb screws and brass fittings so as to form "when unfolded three legs with cross rail " and sliding rail fitted to ditto." The sliding rail has a rest for the drawing, and the whole folds into one piece, "weighing only " 3 lbs."

[Printed, 4*d*. No Drawings.]

A.D. 1855, May 21.—Nº 1128. (* *)

EASSIE, PETER BOYD. —(*Provisional protection only.*)— "A " sectorial or radial eliptograph."

"This improvement consists in a pillar fastened to a base " plate, and adjusted in position by three indexes, setting out the " conjugate and transverse axis of the intended ellipse. This " pillar carries a moveable arm, which is adjusted to the required " height by a milled head having a pinion fastened to its spindle, " the pinion working in a rack sunk on one side of the pillar; the " outermost end of the said arm terminates in a ring to receive a " universal ball joint, through which a pen or pencil holder " works. To the upper end of the pillar is fixed also another " arm carrying a circular guide plate, which plate can be turned " on pivots at any angle to the base plate above mentioned, and " when once set is kept in position by the milled head aforesaid. " To facilitate the setting of the guide plate to any required " angle, a sector will be used capable of being thrown back, so " as to allow the pencil holder to slide on the edge of the " guide."

[Printed, 4*d*. No Drawings.]

A.D. 1855, June 26.—Nº 1456.

LEISS, FREDERICK, and SCHNEIDER, CHARLES.—" Manu- " *facturing* 'mica letters,' numerals, shop signs, figures, arms,

" devices, & ornaments." Part of this invention relates to painting sheets of mica, and to applying drawings and other ornamentation to sheets of mica. The painting is executed " in " transparent and untransparent colors, oil colors, varnish colors, " enamel colors, water colors, opaque colors, &c."

" Drawings and coloring" are put on " in the way of printing" from copper plates, wood, or any other impressions from engraved surfaces, or by means of lithographic or photographic printing. " A variety of other processes" may be employed, namely, " electro-magnetic, galvanic, or any other chemical and generally " known processes," and those different methods, " by most of " which colors and drawings will be burnt into the mica." Other ornamentation consists of arabesques and marginal ornaments in transparent and non-transparent colors.

The sheets are afterwards fixed on glass by means of transparent and water and fire-proof cement, or are put between two glass plates.

[Printed, *4d.* No Drawings.]

A.D. 1855, July 24.—N° 1676.

WOOD, Benjamin.—" An improved preparation of colouring " matter for the manufacture of ink, artists' colours, and for other " purposes for which such colouring matter may be applicable." The colouring matter is cochineal treated in the following manner:—9 ounces of common carbonate of soda is dissolved in 27 quarts of water; about 8 ounces of citric acid is added thereto, and when this solution has been brought to the boiling point, 1½ lb. of cochineal is put in; the boiling is continued for about an hour and a half, after which the liquor is strained and allowed to settle and cool. " The clear liquor" is boiled again; about 9 ounces of common alum is added thereto, and the mixture is kept boiling for five minutes; the liquor is then drawn off into coolers and allowed to precipitate. In two or three days all the solid matters will be deposited, and the liquor will become perfectly clear.

The liquor is drawn off by means of a syphon; the precipitate is filtered, washed in distilled water (to remove any acid that may be contained in it), again filtered, and then dried.

The dried precipitate may be employed " in the manufacture of " artists' colours."

[Printed, *4d.* No Drawings.]

A.D. 1855, October 10.—N° 2261.

GEDGE, John.—(*A communication from Henry Sauzay.*)—(*Provisional protection only.*)—" Improvements in machinery or " apparatus for placing on card drawings used in various manu- " factories." The apparatus is composed of three distinct parts; one consists of (1) two frames, the smaller moving within the larger and having on it a stop whereon rests the sketch or design to be drawn; (2) a cross bar fixed below the smaller frame and moving with it by means of rollers and pulleys; (3) a mesh fixed " by a screw, which is to work in an iron lath, and regulates the " vertical threads of the frame, the horizontal threads being fixed " in any convenient manner."

The second part is formed " by a series of framework " serving to support " an object glass, two lamps, and reflectors."

The third part is an upright " composed of two pillars, round " or square, and a capital or cross cornice piece, inside of which " work pulleys, chains, and counterweights."

The whole being fixed in position " will form an apparatus " carrying the lamps, object glass, reflectors, and sketch, which " slides up and down the pillars " and is worked by a handle behind. Beneath is placed a table for the artist, " who draws a " curtain entirely around him;" to magnify the sketch he turns the handle, " which will allow the apparatus to descend towards " the table;" to diminish it " he pulls a pulley, which with the " aid of counterweights in the pillars will cause the apparatus to " rise."

[Printed, 4*d*. No Drawings.]

A.D. 1855, October 31.—N° 2426. (* *)

RAMMELL, Thomas Webster.—" Improvements in preparing " black lead, chalk, and other materials used for drawing, writing, " and marking." This invention has for its object the coating black lead, chalk, &c., with cement " in order to give strength " thereto and increase the diameter thereof." Various cements may be used, but the patentee prefers one of " whitening and size " made into the consistence of soft dough."

The machinery and the coating are thus described:—On a fixed bed or table is a sliding plate moved by a screw, " its two ends being " guided by guides fixed to the table." On the sliding-plate " are

" fixed any number of cylinders or other proper form of chambers" for containing the cement. Each cylinder has a piston " to express " the cement out at the end and through the moulding die or " orifice." The ends of the cylinders fit into a fixed block, and a moulding orifice for each is placed in a recess in front of it. The moulding orifices consist of central cylindrical hollow holders for receiving the ends of pieces of black lead or other marking material, " such marking material being cut or formed with four " equal sides," so that on entering the orifices they will admit of the cement passing through the spaces left between their sides and the interior of the orifices. " In addition to the central passage " for the cement, there is an opening through the die above and " below the centre for the passage of the cement." On the cement being expressed from the cylinders through the orifices, it enters moulds formed in a block, which is fixed to the sliding plate by pins. These moulds hold the pieces of lead, &c., and as soon as the cement passes to the end of them, the movement of the sliding plate is stopped; the moulds " are to be removed from " the front of the moulding orifices," and the coated pieces are then to be forced out of them by rams. The end of the rams nearest to the moulds is made with "a hollow conical recess," which serves to keep the outer ends of the leads, &c. " properly " centred in the moulds," when the block is placed in its proper position. Other apparatus than pistons may be employed, and the marking material may be cut into various shapes.

In constructing pencil cases, the interior of the caps thereof is furnished with a cutter and with a conical guide, but the patentee makes no claim thereto.

[Printed, 6*d*. Drawing.]

A.D. 1855, November 14.—N° 2573. (* *)

MÖLLER, JOHANNES.—(*Provisional protection only.*)—" Pro" ducing a transparent photographic picture on ivory without " injuring the nature of the ivory, so as to be able to finish the " picture with colours like other miniatures."

This invention " consists in producing a transparent positive " photographic picture, and bringing or transferring the same " upon ivory by means of a gelatine or glass medium, which " leaves the ivory free from all injury, and will enable the artist

" thus to finish the picture so brought or transferred on ivory " with colours like other miniatures prepared on ivory."

[Printed, 4*d*. No Drawings.]

1856.

A.D. 1856, February 27.—N° 504.

INGLIS, Alexander.—(*Provisional protection only.*)—" An " improvement in the manufacture of flexible bottles or cases for " containing colors and other fluids and semi-fluids." These articles are made of gutta percha or of a mixture of gutta-percha and india-rubber; they are tubular in shape and thin so as to admit of being pressed flat. At one end is a neck which is closed by a capsule of gutta percha; the other end is left open for filling, and one side of this end " is made somewhat longer than " the other side in order that it may be folded and cemented over " on the other side."

[Printed, 4*d*. No Drawings.]

A.D. 1856, March 13.—N° 609.

REES, George.—" An improved method of producing figured " or ornamental surfaces on glass." A sheet of " flat finished " glass," either white or colored, is rendered plastic " by heating " it in a reverberatory furnace " and is then pressed between a pair of metal dies or rollers engraved with the design, &c. required. The dies " may have the pattern raised in the one and sunk in " the other, or one of them may be plain." The impressed in glass is then annealed, and may afterwards be ornamented " by " gilding, silvering, enamelling, painting, staining, or otherwise."

Another description of figured or ornamental surface may be produced " by pressing the glass between dies or rollers so as to " leave the required pattern or inscription in slight relief." After annealing " the raised pattern may be removed by grinding, " when the pattern or inscription will appear dull upon a bright " ground." White glass, coated or covered on one side with a colored glass, may be thus treated, and in this case " the pattern " will appear white upon a colored ground or vice versa."

[Printed, 4*d*. No Drawings.]

A.D. 1856, March 19.—N° 660.

HALL, JOHN BISHOP.—" Improvements in preparing and " treating pictures," whereby " a higher degree of artistic effect " is produced." This invention is applicable to all kinds of prints, but especially to photographs. Two copies are to be taken in the usual way on paper or other suitable substance; they are to be rendered more or less transparent by the application of oil, and each is to be cemented to a separate plate of glass by means of copal or other transparent varnish, " which has been previously " applied at a time sufficiently in advance for it to become partially " dry." When the pictures are dry or nearly so, one coat (or more) of copal or other suitable varnish is to be given to each, and when this is dry the two plates of glass are to be joined together, " so that the lines of the two pictures will coincide, in " which position they must be cemented or framed together." The pictures " may be cemented upon opposite sides of the same " plate," or the imprint " may be taken in duplicate upon opposite " sides of the same paper." A variety of backgrounds may be produced " by coloring, tinting, and shading," by cutting out parts of the back picture, or " by all together in different com- " binations."

[Printed, 4*d*. No Drawings.]

A.D. 1856, April 3.—N° 804.

PONTIFEX, EDMUND ALFRED, and NEEDHAM, WILLIAM. —(*Provisional protection only.*)—" Improvements in the manu- " facture of preparations or primings used for preparing canvass, " wood, or other material for the reception of pigments or colors." It is proposed to employ " the spent wash of distilleries, brewers' " yeast or grounds, or the resinous or glutinous matter produced " in the preparation of flax, either separately or in combination." After discharging therefrom " any impurities or substances that " may be therein contained inimical to the purposes " of this invention, the liquid or semi-liquid so obtained is used " in com- " bination or otherwise with white or red lead or the other " ingredients ordinarily used by painters and others for primings " and first coatings."

[Printed, 4*d*. No Drawings.]

A.D. 1856, April 18.—Nº 931. (* *)

THOMPSON, George.—" Improvements in instruments or " apparatus used in drawing or marking with crayon, 'blacklead,' " or other such materials." The principal parts of this apparatus are an outer case, an internal tube, and a propeller. The case, of wood, ivory, metal, or other suitable material, has a longitudinal slot in it. The tube, which has a similar slot in it, has a nozzle affixed to its lower end. The "fin" of the propeller moves in these slots, and is sometimes connected to an outer ring or ferrule; otherwise the upper end of the propeller is formed with slits so as to effect a slight frictional pressure against the sides of the tube. The outer end of the tube "is slit on opposite " sides, with a tendency for the parts to incline somewhat in" wards." The case and tube are held together by a ring or ferrule.

In a modification of this arrangement the tube extends only partially into the case, which must then be "formed internally " as a continuation of the tube." The nozzle is formed with a screw, whereby it is more readily attached to the ferrule, and detached for the purpose of being replenished. The fin should be connected to a sliding tube "to prevent its displacement by " the yielding of the outer tube."

[Printed 6*d*. Drawing.]

A.D. 1856, May 6.—Nº 1062. (* *)

BLAKE, Obed.—" Improvements in applying practically the " principle of internal reflection within transparent substances."

1st. "Grating illuminators" for "obtaining the greatest " possible amount of light for places which would usually be " dark."

2nd. Using a solid parallelogram of glass "for obtaining " designs or patterns." The said glass is ground and polished " on all its sides and at both ends," and its dimension is " governed by the size and number of reflections" it is desired to produce. "This instrument resembles the kaleidoscope, but " possesses greater range; the objects are reflected parallel to " each other, and as any fabric or texture can be used as a ground, " the designer is enabled to judge of the effect of the pattern when " worked up."

The Drawing shows a parallelogram mounted upon a stand, and having a cell for the reception of the object or objects to be examined.

[Printed, 10*d.* Drawing.]

A.D. 1856, October 25.—N° 2510. (* *)

SEXTON, JOSEPH.—(*Provisional protection only.*)—" Improve-" ments in the construction of caustic holders, applicable also to " the holding of leads, chalks, and other marking materials." The holder is made in two parts, the one to receive the caustic or marking material, the other to carry the propeller. "These " two parts," says the inventor, " I sometimes make tubular, the " propeller part to fit on to the rear end of the other (which may " be slit to give it a spring), and by sliding over it to force the " propeller against the caustic or other substance contained " therein and push it forward. In this instance the propeller " stands up from the bottom of a tubular recess, but the pro-" peller portion of the holder may take the form of a solid " plunger, and work in the barrel which carries the caustic; the " propeller rod in that case projects from the extreme end of " the plunger." "When the holder is adapted for holding " caustic I provide a screw cap for covering the pointed end of " the holder. A piece like this may also be used in crayon and " black lead holders as a receptacle for chalks or leads."

[Printed, 4*d.* No Drawings.]

A.D. 1856, December 26.—N° 3060.

ROSTAING, CHARLES SYLVESTER.—" Improvements in pre-" paring and combining metallic substances for the production " of colours, and in manufacturing the same." This invention consists "in the production of unalterable and non-poisonous " colors applicable to painting in oils, water colors, fresco paint-" ing," and in short " to every description of painting or coloring." Oxide of zinc, "obtained from no matter what mineral," forms the foundation of these colours, and the patentee has chosen " blende or native sulphuret of zinc from which to obtain this " oxide more or less pure, as it is more economical by reason " of its secondary production (sulphuric acid) than any other " zinc ore."

He describes also an "overheated reverberatory air furnace" which he uses in the manufacture of his colours.

The blende "is first culled or picked, that is to say, the different " shades are separated," and having been washed, "they are " reduced to a powder, fine as flour, by a mill or otherwise." This powder is placed in a suitable receptacle, "and sprinkled " with one hundredth part of its weight of azotic acid or sul- " phuric acid diluted by from twice to four times its weight of " water, the whole being carefully and exactly mixed." The sulphate of zinc of commerce may be advantageously substituted for the acids, in the proportion of 4 lbs. to 100 lbs. weight of brute blende, and then ground to powder in a mill; and to vary the shades still further "sulphate of alumina is added instead of the " acids or sulphate of zinc, in proportions varied according to " the shade of color desired." These mixtures or compositions are put into the reverberatory furnace (previously heated) and spread upon its bottom in a layer of about two inches thick. The heat of the furnace is increased, and as soon as the mixture is become red hot, it is "brazed or stirred over every twenty " minutes with iron pokers or bars in order to renew its sur- " face;" when it has attained a white heat, "and the whole of " the sulphurous acid is disengaged," it is kept in that state for half an hour, "in order to develop the colour in its greatest " intensity;" it is then withdrawn through openings in the furnace, whence it falls into a receiver where it cools. When sufficiently cool "it is ground in a color mill (with excentric " stones) with river water until reduced into an impalpable pow- " der," after which it is "dried and packed in the same manner as " zinc white."

"To make all sorts of color imitating the native ochres, " chrome, Naples and other yellows, greens of every shade, greys " and browns, violet brown, reddish brown, and others, the oxide " of zinc from the blende is colored with metallic oxides, such " as oxide of iron, peroxide of manganese, or the oxides of cobalt, " nickel, copper, chromium, or iranium, and the shade of color " is varied by the addition of oxide of aluminium or alumina;" these oxides are employed "simply in the state of salts, such as " nitrates, sulphates and chlorures and in the state of sulphurs." A detailed account is given of the processes for coloring, of "pre- " cautions to be observed in order always to obtain the same " shade of coloring," and of the proportions used; but the patentee does not confine himself thereto, "as deviations may be "made therefrom to suit particular circumstances." He describes also his method of mixing his colours "to dispense with the use "of oils in painting," for "caseate of lime painting," for printing textile fabrics, and for coloring paper.

The reverberatory air furnace:—The principal parts are (1) a square base; (2) an upper and a lower sole, round and "interiorly "about fifteen to sixteen feet in diameter;" (3) a conduit on each side of the furnace, "traversing the two soles" and ending in a receiver; the conduits are closed by cast-iron plates or doors; (4) two openings for the passage of hot air to roast the blende that is spread upon the upper sole; (5) two muffles, "occupying part of the grate" and "terminating at the open-"ings;" they are to be filled "with massive or solid cylinders of "burnt clay;" (6) compartments "through which passes the "flame from the fuel, having circulated round the muffles;" (7) a "square compartment of about twenty-two inches from side to "side (in thin fire-brick) filled with balls of pumicestone of about "three inches in diameter;" through this "the sulphurous acid "disengaged from the blende" passes into a condensing chamber and thence to other chambers through a pipe "of wrought iron, "lead, or better of copper interiorly platinized;" (8) two cast iron hoppers "which should be furnished with a valve or stopper "hermetically closing the opening, and which when turned "permits the charge to fall upon the sole."

[Printed, 1*s*. Drawing.]

1857.

A.D. 1857, February 6.—N° 346.

POISSON, PIERRE.—"Improvements in preparing and apply-"ing surfaces for painting." These surfaces are intended "as a "substitute for canvas, metallic, and other surfaces used for "painting," for "wainscoting and other mural painting," and for "decorative purposes in lieu of paper hangings;" they are prepared on a cloth by the aid of an apparatus which is composed of (1) an upper cylinder, (2) a knife placed above the cylinder and adjustable by a thumbscrew, (3) a lower cylinder, carrying the cloth which on unrolling passes between the upper cylinder and the knife, (4) a hopper, opened and closed by means of a crank, (5) a table "inclined at about forty-five degrees, its upper " part being placed about four inches below the knife," (6) a winch, fixed to the lower part of the table, furnished with a ratchet, and having three bands wound round it at equal distances, (7) a piece which nips the cloth and causes it to pass between the upper cylinder and the knife, (8) friction rollers to facilitate the moving of the cloth, (9) a second winch for bringing the table into a horizontal position by the aid of cords and pulleys.

First operation :—A solution of double size or Flanders size is poured into the hopper. The cloth being impregnated therewith is removed and dried by suspension in the open air. A liquid composed of gum copal and water with sometimes an addition of white of egg or dry albumen diluted in water is substituted for the solution, and the cloth, being replaced and set in motion, receives a layer of it, and is again taken off and dried. The hopper is removed to make way for one which contains oil colour; the cloth is put again into the machine and covered with a layer of paint, which may be graduated "from a thin coat to the " thickness of forty or fifty ordinary coats," after which it is again taken out and dried.

Second operation : — The table is lowered and made level. The cloth is stretched thereon, and muslin or paper (unsized) is caused to adhere by the aid of paste to the coating of paint. When the paste is dry the cloth is turned uppermost and saturated with water, so that it readily leaves the paint.

The artist executes his work "on the film or skin of paint." When his work is dry, a piece of muslin is attached to the face thereof; the muslin at the back is removed by moisture; the whole is "mounted in frames on walls, on wood, or on metals," by means of a suitable adhesive mixture, and the muslin on the face is removed by moisture.

These surfaces may be applied to "Xicochromy, or painting by " impressing or printing in oil colours."

[Printed, 6*d*. Drawing.]

A.D. 1857, March 5.—N° 640.

BRADSHAW, William Frederick Taylor.—" Improve" ments in making palette and other like knives." The tang, bolster, and hump are made in one piece, the handle being affixed in the ordinary way; or the handle, bolster, and hump may be made in one piece. The hump "contains a deep groove at the " top, so as to admit the corresponding or elastic part of the " blade;" the groove may be formed completely through, or the ends of the hump may be left solid. The blade and hump are fastened together by soldering, by aid of "a strong solution of " gum and steel filings, or boiling resin," or by piercing both with holes and screwing or riveting them together. The blades are made "in double lengths;" when required, they "are reduced " by eccentric rolling before they are hardened and tempered, and " require very little grinding afterwards;" the lengths "are cut " exact to make two of whatever size." The parts made in one piece are either cast from metal or compounds of metal, or they can be cast with wrought-iron tangs; or they may be shaped out from any tough wood.

The handle and hump being intended to wear out many blades, " they are constructed so as to exactly fit each other according " to size and number."

[Printed, 10*d*. Drawing.]

A.D. 1857, March 5.—N° 652.

NEWTON, WILLIAM EDWARD.—(*A communication.*) — "An " improved manufacture of tracing cloth." The composition which the patentee uses consists of 8 parts by weight of spirits of turpentine or camphine, 8 of castor oil, 2 of Canada balsam, and 1 of balsam copaiva. He mixes the ingredients well together and applies the composition to tracing muslin with a sponge, " taking care to spread it evenly over the whole surface." He then rolls up the muslin, and after about 36 hours opens it out and rubs off with cotton or other cloth "any excess of the com- " position which may remain on the surface." He rolls it up again for a like time, and, if on unrolling it the surface is not dry, he wipes it with a cotton cloth. He then rolls it up again, " and in two weeks" afterwards it will be fit for use.

The patentee does not limit himself to the above-named ingredients or proportions; he sometimes substitutes naptha "or " other hydro-carbonaceous liquid" for turpentine, other oil for castor oil, and in some cases he dispenses with the copaiva.

[Printed, 4*d*. No Drawings.]

A.D. 1857, April 21.—Nº 1121. (* *)

NEWTON, Alfred Vincent. — (*A communication from M. Liegrist.*) — (*Provisional protection only.*) — "Improvements in "rules and other measuring instruments."

"One of the forms which may be given to the instrument is "that of a box tape, which will permit of the application of the "invention to the measurement of timber in forests. One of the "scales on the tape is to be divided as usual into feet and inches, "for the purpose of giving the direct measurement of the circum-"ference of circles. A second scale will shew their diameters by "its corresponding divisions, and a third scale will give the "superficies or areas of the circles, of which figures of the second "scale shew the corresponding diameters.

"The other side of the tape may contain a scale which will give "in inches and fractions of inches, and feet and fractions of feet, "the cubes of the cylinders, of which the other scales give the "diameters and areas.

"The arrangement of this instrument will therefore allow of "the linear and cubical dimensions of a cylinder being estimated "by measuring either its circumference or its diameter; it is "consequently well adapted for measuring uncut timber."

"The same principle of corresponding graduations may also "be applied to a rigid rule, and also to other similar instruments, "and the scales may be modified to suit various kinds of measure-"ments. The number of scales may also be increased, giving "for instance, the homologous proportions of other similar "geometrical solids, such as spheres and the different poly-"hedrons."

[Printed, 4*d*. No Drawings.]

A.D. 1857, May 27.—Nº 1509. (* *)

HODGES, Richard Edward.—"Improvements in guages and "scales."

"The instruments consist of triangles of metal, wood, or other "material, which are graduated on their bases, and from the "graduations lines at right angles to the bases are drawn, until "they meet the opposite sides of the triangles. Two similar "triangles of this description are used at one time, and if it is "required to guage the size of a hole, the apices of the two "triangles are projected through it from opposite sides, and the

" distance which the triangles lap is read off on the scales, and " gives the internal diameter of the hole. When it is wished to " guage the interior of a tube, then, in place of using two complete triangles (which would render it necessary to have triangles " of a different size for each considerable variation in the size of " the tube to be guaged), one complete triangle only is used, " together with sections of different sizes of the other triangle; " and these sections when in use are attached to a graduated rod, " and are in this way introduced into the mouth of the tube, " together with the complete triangle. Triangles thus graduated " may be used as scales, when, for example, it is required to draw " one line parallel to another, and at a certain distance from it. " When used for this purpose, the edge of one of the triangles is " brought up to the first line, and then the other triangle is laid " against the other edge of the first triangle, and is caused to lap " over it to the required extent, as shown by the graduations, " and the second line parallel to the first is drawn."

A method of measuring the thickness of a solid bar or sheet, in which one of the scales has a stop, is set forth.

[Printed, 8*d*. Drawing.]

A.D. 1857, June 24.—N° 1773. (* *)

JOHNSON, JOHN HENRY.—(*A communication from Elisha Lee.*)—(*Provisional protection only.*) — " Improvements in the " preparation of surfaces for receiving paintings or printed " impressions thereon." This preparation may be effected by coating the surface of the material (muslin, linen, silk, &c.) " with a composition made by boiling well washed rice in water " in a clean porcelain vessel, there being just sufficient water " to prevent the rice burning. Whilst boiling, a small quantity of pulverized borax, of either gelatine, isinglass, or " best white glue, is added, taking care to stir and mix the " whole well while boiling. With this rice paste equal quantities " in bulk of white lead (or flake white), best Paris white, and " white pipe clay, are mixed well together with linseed oil (either " boiled or raw), and ground fine, so as to form the whole into a " thick composition, which when spread evenly on any required " surface, and sufficiently dry, will be found to possess an " absorbent ground, insoluble in boiling water, and capable of " receiving impressions or colors." "Paper pulp and potters'

" clay in small quantities may also be added to the above com-
" position, and ground fine with it, where the canvass is required
" to have the tooth preferred by some artists in oil and in pastel
" painting."

[Printed, 4*d*. No Drawings.]

A.D. 1857, July 8.—Nº 1896.

BRIANCHON, Jules Joseph Henri.—" Improvements in
" colouring and ornamenting glass, porcelain, earthenware, and
" other ceramic substances." The Specification describes the preparation of the fluxes and of the colouring matters employed in this invention.

The flux required (except for mother-of-pearl tints) is prepared as follows:—Resin (30 parts) is put into " a capsule resting in a
" bath of sand;" it is heated gradually, and as it melts, nitrate of bismuth (10 parts) is poured in a little at a time, stirring continually in order to incorporate them. As the mixture " begins
" to brown," essence of lavender (40 parts) is added, and the whole is well mixed together. The capsule is withdrawn from the bath, and while gradually cooling, the solution is increased by the addition of 35 parts of essence of lavender. The whole is then left to cool for some hours.

Colouring matters are thus obtained; 1, yellow:—Common resin (30 parts) is dissolved in a capsule heated by a sand bath; when it is on the point of melting, nitrate of uranium (10 parts) is added, and while stirring, from 35 to 40 parts of essence of lavender. When the liquid matter is " suitably homogeneous," the capsule is taken out, and more essence of lavender (from 30 to 35 parts) is added. This colouring matter is mixed " in equal
" parts with the flux of bismuth," and is applied on the article with a brush.

2. Orange red:—It is made by melting 15 parts of common resin, and adding thereto after fusion 15 parts of nitrate of iron and 18 parts of essence of lavender at the same time. These additions are made a little at a time; the mixture is constantly stirred; as soon as it becomes homogeneous it is removed from the fire, and when a little cooled is increased with 20 parts of essence of lavender. This colouring matter, mixed with the flux
" in proportions equal to two-fifths or one-third, or other inter-
" mediate proportions of its weight," gives accordingly " a red,
" orange, or nankin colour."

3. Imitation of gold :—"The two preparations indicated above" are mixed, putting in "two or three parts of the preparation of " uranium for one part of preparation of iron."

4. Variegated colours of the prism :—" Ammoniuret or cyanuret " of gold and of mercury, or ioduret of gold, or gold dye," mixed with essence of turpentine, is pounded into a paste, which is allowed to dry "in order to be repounded when mixed with " essence of lavender." One part of this "auriférous product," mixed with from one to 10 parts of the flux, is spread with a brush over the article, after which a coating is given to it with a solution of uranium.

To obtain mother-of-pearl tints, " the flux of bismuth is mixed " with flux of lead, and sometimes chloride of antimony mixed " in resin is added."

The essence of lavender may be replaced by any essence which does not precipitate substances wherewith it is mixed. Common resin may be replaced by colophany or any other resin.

[Printed, 4*d.* No Drawings.]

A.D. 1857, August 7.—N° 2130. (* *)

SCARTLIFF, JOHN ROBINSON.—(*Provisional protection only.*) —" Certain improvements in mathematical instruments."

To the joints by which the limbs or parts of compasses, callipers, and other instruments of a like nature are connected, a scale is attached. In "a pair of ordinary drawing compasses," "the head " or joint part of the 'he limb' has one half of its periphery " toothed, to work in a small pinion pinned in a slot in the shoul- " der of the 'she limb.' Upon the face of this shoulder is placed " a circular dial, engraved upon the face in feet and inches; the " rivet which secures the pinion carries a pointer or index, which, " as the compasses are opened, denotes to a given scale the num- " ber of feet or inches which the points of the compasses may be " asunder, so that the ordinary scale or rule would not be required. " Or the dial may be placed upon the head of the 'she limb,' with " a quadrant rack working in a slot upon the shoulder of the " same limb, and gearing into a small pinion upon the shoulder " of the 'he limb.' This pinion drives a toothed wheel mounted " upon the dial pin, between the two parts of the joint at the " head of the compasses. The quadrant rack, before named, " may be used as a substitute for the quadrant at present em- " ployed in compasses or dividers used by joiners and others, and

" may be furnished with a similar adjusting screw and thumb " piece, which is for the purpose of maintaining the dividers " opened to a given point."

[Printed, 4*d*. No Drawings.]

A.D. 1857, December 17.—N° 3102.

JOHNSON, Henry.—" Improvements in apparatus for drawing " geometric curves." An upright passes through one end of a horizontal rod, so that the rod may revolve round it. On the rod is a slide which carries a pencil or marking instrument.

The upright is composed of a lower part made of wood and furnished with a metal point, a middle part of metal " driven into " the top " of the lower part, and a handle fixed by a set screw to the upper portion of the middle part. The rod is divided into inches and parts of inches; it may be made with a block at one end for the upright to pass through. At or near the outer end of the rod is a drum or pulley, and a chain or band secured to the middle part of the upright at one end passes round the drum and is attached at the other end to the slide either directly or after it has first been passed round two pulleys on the rod, " according to " the nature of the curve which it is desired to trace." One of these two pulleys is mounted on a slide which is clamped by a binding screw to the rod; the other similarly mounted is coupled by a screw and nut to the slide which carries the pencil. As the rod is moved round by hand, the chain is " wound on the axis, " and the slide with its pencil is drawn progressively away from " the centre." The chain is prevented " from surging on the " axis " by a " supporting block " and a " covering plate " which slides down the axis and is kept in position by a binding screw. " The form of the axis and consequently that of the curve formed " by it " may be changed by pieces fixed by screws to the supporting block. The diameter of the axis may be varied by sliding tubes " which slip one over the other and are of different lengths." At the outer end of the rod is a standard carrying two small wheels and serving when the instrument is in use to keep the rod " accurately parallel with the surface on which the curve is " traced."

" The instrument may be varied by using a boss revolving upon " the upright, with a slot in it through which a flat bar passes, " with teeth on one side, gearing into the teeth of a pinion

" fixed on the upright," so that the bar (which carries a marker) is moved by the pinion. " Several change pinions " may be used to produce different curves. In place of pinions " a spiral toothed " rack or pinion, decreasing in diameter from the base upwards, " may be used, the toothed bar being kept up to its work by a " spring." The modifications are described at length in the Specification.

[Printed, 1*s.* 6*d.* Drawings.]

1858.

A.D. 1858, January 9.—N° 39. (* *)

CHURCH, William.—" Improvements in measuring rules, compasses, and other mathematical instruments, and in machinery " to be employed in manufacturing measuring rules and other " mathematical instruments."

1st. Making the folding joints of measuring rules " of several " plates of metal equal in thickness to the thickness of the portions of wood with which they alternate."

2nd. " Making the metal part of the principal joint of a rule," so that " the base of the said metal part is made of a curve having the centre of the rule joint for its centre." Other modifications are set forth.

3rd. " The addition of a slide similar to that of the slide rule " to the set square " used in drawing. A great number of angles can thus be drawn.

The graduation of the slide is effected by a machine.

4th. " Graduating the head of the screw used on one leg of a " pair of compasses for effecting fine adjustments."

5th. " A machine for cutting dovetail grooves for the before- " mentioned set squares and slide rules." Two revolving cutters are " fixed on axes inclined to one another." For forming the slides the relative position of the cutters is changed.

6th. " Machinery for manufacturing measuring rules." " A " series of circular cutters " are " mounted upon an axis at " distances equal to the thickness of the pieces to be cut." " The " slips of wood are not quite separated by the cutters," and the thin joining is afterwards cut away by means of discs furnished with cutters, at the same time as the edges are smoothed by the same apparatus. In order to cut away the wood for the metal plates of the joint "the piece of wood is supported on a platform " turning on a vertical axis" which rotates " through a quarter " of a circle;" during its motion a pair of reciprocating cutters reduce the wood to the requisite thickness; "the curved figure of " the portions cut away is perfected by a fixed cutter against " which the piece of wood is carried during its motion." When the metal plates of the joint have the curved figure described under the 2nd improvement, "the wood may be cut away by two " rotating cutters between which the wood passes, a middle cutter " forming the slit for the middle plate of the joint." By stringing a number of the joint plates upon a mandril, and using a reciprocating cutter, the edges of the plates are planed; the circular parts are planed by means of a slow motion through three quarters of a circle; geared drills, working simultaneously, drill the requisite holes, and rams (lifted by crank) insert the pins. " The tips of the rules are formed from sheet metal forced into a " trough-like die." Metal scrapers on an endless band smooth the sides of the rule. The divisions are produced by a series of cutters pressed by a spring; or, the graduation " may be produced " by a compound die made up of a series of small dies dovetailed " or otherwise connected together."

[Printed, 3*s*. 4*d*. Drawings.]

A.D. 1858, February 6.—N° 222.

POTTS, William.—" Improvements in painting upon glass, " and in protecting paintings upon glass." The artist is to lay on a ground colour, and then to "remove the marginal colour " from the outline of the design, by which means transparency " of effect is produced." He is to " paint some portions of the " same design on the face of the glass, and other portions on " the back."

To protect such a painting a sheet of glass is placed upon it " with a marginal line of varnished paper or other material " between the two plates," and the edges are hermetically sealed round with varnish or cement. The back is covered with a sheet of gutta percha or other plastic substance, and this " is backed " up by plaster of Paris, on which the glass carrying the design " is securely imbedded."

[Printed, 4*d*. No Drawings.]

A.D. 1858, February 18.—N° 309. (* *)

NEWTON, WILLIAM EDWARD.—(*A communication from Giovanni Casselli.*)—" An improved optical instrument which the " inventor denominates a tropescope."

" It is composed of two prisms, denominated by the inventor " 'prismes à réflexion totale,' which are enclosed in a case " consisting of two telescope tubes." One of these tubes encloses a prism, " which constitutes the object-glass ; " the other prism, " which is of smaller dimensions, is the eye- " glass," " and is enclosed in the smaller tube " " which forms " the eye-piece, and may be turned round and drawn out or " pushed in at pleasure in the same manner as the eye-piece of " an ordinary telescope." The spaces left between the prisms and the sides of the tubes " are filled up with pieces of cork, so that " there only remain in the tubes rectangular openings " " for the " passage of light." The two extremities of the instrument are " closed by plain glasses, which serve to protect the surfaces of " the prisms from the deposit thereon of dust."

The rays of light from the object " are subjected to a double " refraction and reflection in their passage through each of the " two prisms," the base of the said prisms being so inclined to their angular faces that total reflection of light takes place from the said base.

When the prisms are at right angles to one another, the image of the object seen through the instrument is reversed.

It is stated in the Final Specification that " painters, sculptors, " engravers, and others, may with this instrument inspect their " work on all sides and in any direction (*i.e.* from any point of " view), instead of employing (as is ordinarily done) simple " mirrors."

[Printed, 6*d*. Drawing.]

A.D. 1858, March 19.—N° 567. (* *)

RHODES, WILLIAM HENRY.—" Improvements in speed indi- " cators and calculators."

1st. " An improved apparatus or machine for indicating the " speed of spindles, shafts, or other objects," which is " particularly " adapted for ascertaining the velocity of mule spindles. I cause " the object whose speed or velocity is to be measured to turn " a worm working in a toothed wheel in order to give motion by

" means of other toothed wheels and pinions to hands or indi-
" cators in connection with a dial, the divisions of which are
" arranged according to the kind of work to be measured or
" indicated." The Drawing shows an apparatus for indicating the speed of mule spindles, the long hand showing the number of revolutions up to 1000, and the short hand the number of thousands and parts. The number of revolutions in a given time are taken by means of a time piece in connection with the above-described apparatus.

2nd. "Proportional compasses, the arms or beams of which are
" furnished with slides connected together by an universal joint
" and right and left-handed screws, so that the points can be ad-
" justed with accuracy to any required scale or distance. The
" traverse of the slides is exactly in the same proportion as the
" movement of the arms and points." The distance between the latter may be regulated by scales, and the value of the traverse of the arms is determined by numbered divisions. The application of this instrument to the determination of the size of wheels for spinning a certain quality of yarn is set forth. Racks and pinions may be employed to move the slides.

[Printed, 10*d*. Drawing.]

A.D. 1858, March 26.—N° 639.

BÉRARD, PIERRE HIPPOLYTE GUSTAVE.—"Applying concen-
" trated collodion to the effect of superseding caoutchouc in
" waterproofing stuffs of all descriptions for manufacturing
" garments and wearing articles, and also for applying it over
" painted surfaces instead of varnish." The patentee makes a concentrated collodion varnish, which he asserts to be preferable to other varnishes, "being cheaper and more lasting," for spreading over pictures and other articles. The varnish is composed of alcohol, 10 parts; ether, 63 parts; azotic cotton, 25 parts; castor oil, 2 parts. He modifies the proportion of the various constituents "according as the varnish is required to be unctuous
" or dry."

[Printed, 4*d*. No Drawings.]

A.D. 1858, April 14.—N° 806. (* *)

GORHAM, JOHN.—"Improvements in optical instruments, by
" the revolution of which various designs or patterns may be
" produced to the eye."

This invention consists of combining with "colour tops or " wheels" "the use of a disc with a hole in the centre sufficiently " large to cause it to fit loosely on to the spindle of the top or " wheel, but only so large as to admit of its vibrating to a small " extent, such disc having appended at or near its circumference " a light weight for the purpose of slightly retarding its motion " with the top or wheel, and causing it to vibrate as required on " the spindle of the same, on which it is placed during the " revolution of the top or wheel. Thus the disc when placed " on the spindle is made to revolve about the same axis and " in the same direction as the wheel, and in a plane parallel " therewith, but at a short distance from it, and with a motion " retarded as to its velocity; while as to its direction, the motion " is broken up or converted into a series of rapid jerks or " isochronous vibrations. This moveable disc is blackened on " its upper surface, and has a pattern or device cut completely " through and out of its substance, so as to admit of the colours " on the surface of the ordinary colour top or wheel below being " seen through such pattern or device when viewed from " above. It results from this arrangement, that if the colour " top or wheel rotates vertically, then the vibrating disc occupies " a position in front of the wheel that is between it and the eye " in all cases."

[Printed, 4*d*. No Drawings.]

A.D. 1858, July 3.—N° 1501.

SARONY, Oliver.—" Improvements in treating and colouring " photographic pictures." The object of this invention is "to " give to the artist's work upon paper the softness, delicacy, and " transparency which the same work would present upon ivory." The paper on which the photograph has been taken is stretched on a frame having a moveable panel. When the photograph has been coloured in the ordinary way with water colours, the panel is removed, the picture is placed face downwards upon a hot metal plate, and the back is brushed all over with melted beeswax until the paper is saturated, and the wax appears at the other side. A sheet of paper should be interposed between the picture and the hot plate.

"The photographic picture may now be mounted like any piece " of ivory upon a light or cream-colored ground of paper, enamel,

" or other substance, or a panel of a light or cream shade may be " introduced into the frame."

A similar effect may be produced "by using oil, varnish, or " gum, to give a semi-transparency to the paper." The process may be reversed " by applying such mediums to the paper before " coloring."

Should it be found necessary to give a few finishing touches, " a little ox gall, soap, or other substance to remove the greasy " surface from the wax, will require to be used with the color, or " before it is applied." These after-touches may be sunk into the wax by exposing the picture to a heat sufficient to melt the wax surface.

[Printed, 4*d.* No Drawings.]

A.D. 1858, August 2.—N° 1741.

AGNENI, Eugenio.—(*Provisional protection only.*)—" Increasing " particularly the effect of decorative pictures, landscapes, draw" ings, and prints."

The invention consists " in cutting the outlines of pictures or " other artistic productions (which must be performed with a " peculiar art for the purpose), and in applying the same to " looking-glasses."

The outline is marked upon the quicksilver; the portion within the outline is removed, and the picture, &c. is secured to " the cleared part." Or the picture, &c. may be secured to a plain glass, " outlining the same afterwards with the reflecting " substance."

[Printed, 4*d.* No Drawings.]

A.D. 1858, September 29.—N° 2170. (* *)

LUIS, José.—(*A communication.*)—(*Provisional protection only.*) —" A new method of fixing pastel pictures."

" The pastel picture is executed in the ordinary manner, care " being taken not to use unpasted paper, the thick printing paper " for copper-plates being best. On a smooth marble or wood " slab a layer of almost liquid silicate of potash or natron about " one-fifth of an inch in thickness is spread in proportion to the " size of the picture. The back of the pastel picture is then " placed upon the silicate surface, so that the liquid may be " absorbed through the back of the paper. When the picture is

" well saturated, it is held so that the superfluous liquid may " run off; after that the picture must be placed upon a paper to " dry. This operation is repeated and the picture is completely " fixed. The above proceeding can also be applied to paper-" hangings of rooms and decorations of churches and theatres."

[Printed, 4*d.* No Drawings.]

A.D. 1858, October 13.—N° 2283. (* *)

BENDA, Antoṅ.—(*A communication.*)—" Improvements in the " manufacture of models of the human and other figures, to be " used as toys, for tuition, and for other purposes."

This invention consists in constructing models of the said figures " by forming the limbs and other parts of the same sepa-" rately, and combining them by means of india-rubber or other " elastic strings or cords," preferably placed " in the interior of " the figures." In a modification of the invention, the parts of the said figures may be united by means of wire or catgut.

The drawing represents figures in which the limbs and body are formed in separate pieces, and holes are pierced " through the " upper parts of the limbs and body." " The limbs are secured " to the body and held together by india-rubber or other elastic " cords, passed through the holes therein, and secured by knots, " cement, by a wedge, or other suitable means. The elasticity " of the cord allows of the limbs being turned and placed in " a variety of positions, while the fastening afforded by the cord " is sufficiently strong to cause the position in which the limbs " are placed to be retained." The head may be attached to the trunk " by an elastic cord, which allows of the head as well as the " limbs being moved." In models of animals, the tail may be secured to the body by an elastic cord. The parts of the limbs may be united to each other " by elastic cords, in a manner " similar to that before described, to allow of every joint being " bent into various positions, in order to obtain a correct model " or representation of the figure to be represented."

[Printed, 6*d.* Drawing.]

A.D. 1858, October 14.—N° 2295.

BAXTER, George.—" Improvements in coloring photographic " pictures." This invention consists " in combining with photo-" graphic pictures the processes of intaglio, plate, and surface

" printing," also " lithographic and zincographic printing," as a means of coloring such pictures. " As many printing plates, " blocks, or surfaces are prepared as there are intended to be " colors or shades of colors."

When wood blocks are used, dots are made " along each side of " the negative picture, allowing at least two dots for each block " to be employed in coloring the positive pictures." There are taken from the negative " on to ordinary lithographic transfer " paper as many positive pictures as it is desired to use blocks in " coloring," and on each are marked the parts which are to be printed by one of the blocks. Sometimes the positives are printed on " common photograph paper " and coated with gum before they are marked. The surfaces of the blocks are coated " with a " composition of flake white and gold size ;" when this coating is perfectly dry and hard, " a thin surface of transfer varnish is " applied," and one of the marked pictures is laid on the block, and " the marking or drawing transferred to its surface." When the transfer varnish is hardened, the paper is washed off with muriatic or other acid diluted with a little water. The marked blocks " are engraved by hand in the usual manner," the parts not marked being cut away. The details of the printing are given. Sometimes metal, such as is used in casting stereotype plates, is employed instead of wood blocks.

When " intaglio engraved plates " are used, tracings, one for each color, are made from one of the pictures. Each tracing has two dots made on it " corresponding with two of the dots on the " sides " of the picture, and the tracings are transferred on to copper or other plates, which are engraved at the parts marked by the transfer tracing. The process of printing is described.

To color pictures " by means of lithographic stones or zinc " plates," the parts to be colored with each tint are drawn in transfer ink on a series of pictures printed on lithographic transfer paper. A transfer is made in the ordinary manner on to stones or zinc plates, one for each tint, and " the pictures are printed in " succession until they are completely colored." Or tracings of the picture may be made and transferred on to stones or plates, and the " drawing for the different tints " is then made on the stones or plates themselves.

The " methods of obtaining register " in each process are particularized.

[Printed, 4*d*. No Drawings.]

A.D. 1858, October 23.—N° 2367. (* *)

STORTZ, PHILIP CHRISTIAN.—(*Provisional protection only.*)—
" An improvement for taking life-size pictures from smaller
" pictures, either with or without the aid of photography."

This invention " consists in taking and tracing life-size pictures
" from smaller negative or positive pictures in the most simple
" manner."

" Place a double or single lens with camera so that the lens
" is turned in a dark room; place a transparent positive or
" negative image against the daylight. In the dark room is
" placed on an easel a cardboard, canvas, glass, or paper, on
" which will be seen the image on a large scale. If the image is
" negative take Indian ink or any color, pencil, or chalk, and fill
" up all white lines and designs, which, when seen in daylight,
" will produce an exact image of the smaller one. If it appear
" positive on the canvas, take the same ink or color, but do only
" the outlines, which will produce the same effect." Or " in rendering
" the surface of the said cardboard, canvas, glass, or paper
" sensitive to light, an image by photographic means may be
" produced."

[Printed, 4*d.* No Drawings.]

1859.

A.D. 1859, February 16.—N° 436. (* *)

O'DOHERTY, WILLIAM ARCHDALL.—(*A communication from Daniel Dunham Sweet.*)—(*Provisional protection only.*)—" An
" improvement in blacklead pencils and pencil cases." The improvement consists in introducing a narrow strip of india-rubber or a preparation of india-rubber at one end of a pencil " in such
" manner as to be enclosed therein in like manner to the lead at
" the other parts of the pencil," so that when part of the wood is cut away and the india-rubber left projecting, a pencil-mark-eraser will be at hand. The inventor also applies " a portion of
" india-rubber to one end of a pencil case, and such piece of
" india-rubber may be arranged to slide into such end of the case,
" or be otherwise covered when not in use."

[Printed, 4*d.* No Drawings.]

A.D. 1859, February 25.—N° 516. (* *)

PEOVER, George.—(*Provisional protection only.*) — "An im-
" proved optical instrument, being an improvement upon the
" kaleidoscope."

The said instrument is denominated a "chromeidoscope," and " consists of a tube having vertical reflecting mirrors arranged " angularly therein as in the kaleidoscope, an eye-piece being " placed at one end of the tube, and the object at the other " end."

In this instrument "the object or the pieces composing the " same are arranged around or attached to a rotating shaft or " spindle mounted horizontally in a box or chamber on which the " tube of the instrument is secured." The object is illuminated either by direct light or by reflectors, and the spindle may project through slots in the ends of the box, so as "to admit of the object " being moved laterally under the eye-piece," and thus "give " variety to the image." For this purpose the object may also be moveable "backward or forward."

"A rising and falling motion may also be imparted to the " object."

A pair of glass prisms may be adapted "to the object end of " the reflecting tube," so as to decompose the light "whereby the " image is seen."

Sometimes the reflecting tube may be capable of rotation on its axis.

Prisms may be adapted to the eye-piece end of the instrument, so that more than one person can see the object at once.

Mechanical means may be employed to communicate slow rotary motion to the reflecting tube or tubes and to the object.

[Printed, 4*d*. No Drawings.]

A.D. 1859, March 16.—N° 666.

ANSCOMBE, Edmund.—(*Provisional protection only.*)—" An " apparatus for taking an accurate delineation of any view or " object in open air or otherwise." The apparatus consists principally of a portable wooden frame, a parallel frame or traveller, a point of sight, a piece of glass, and a sheet of canvas or paper. The frame is provided with cross rails, a moveable standard, two stumps "to obviate any inequality in the ground and procure a " perfectly upright position," and two braces with iron pins to steady it; the parts are put together with thumb-screws. The parallel frame carries a tracing point, and a "corresponding "point" which holds the pencil and works on the canvas or paper; it moves up and down "a perpendicular rod fixed to the "standard," and is assisted by a weight with a line passing over a pulley on the top of the standard. The point of sight is held in position by three rods that work in three swivels. The glass is placed in the upper part of the wooden frame; it "forms an "imaginary plane" for the tracing point to work upon, and slides in grooves "to extend the field required." The canvas or paper is held between two rails, the upper one "sliding up or down to "regulate the size of intended view."

[Printed, 6*d.* Drawing.]

A.D. 1859, May 3.—N° 1104. (* *)

FRANKLIN, ABRAHAM GABAY.—(*A communication from Gottliel Wilhelm Sussner.*)—(*Provisional protection only.*)—"Improve-"ments in the manufacture of crayons." "The required primary "color is mixed with clay (bolus), well ground together in water, "then dried. When the color is dry, a solution of tragacanth gum "is added to it, and the whole kneaded to a paste, of which the "pencils are formed, by means of a cylinder or press. The "pencils are then again well dried or hardened, and dipped in a "hot solution of stearine, spermaceti, and cocoa-nut oil; after "about an hour's time, the pencils are taken out and washed in "oil of turpentine; thus cleaned and properly cooled, they are "put in wood and framed up."

[Printed, 4*d.* No Drawings.]

A.D. 1859, August 3.—N° 1787.

PIN, AUGUSTE.—"The compounding, preparing, and application "of a new sort of paint." The paint, which the patentee terms "hydraulic white," has a "calcareous base," and he prefers to use stones wherewith to make lime "which will not wholly lose its "color, but will become deliquescent by exposure to air." The stones "are so calcined as not to be entirely slacked;" any method of calcination may be employed, and he describes one "which "gives the best results." The blocks resulting from the calcination "are to be saturated with muriatic acid by slacking them "with a liquid composed of about thirteen parts of water to one

" of acid, and in sufficient quantity to form large trochischs or " pieces;" these are to be dried and to be reduced to a coarse powder. To twenty-five parts of this powder he adds " one part " of phosphate of soda, one of sulphate of zinc, one of glucose " or syrup of potatoes or sugar, and one of wax soap," and in the provisional specification to every three parts of this mass " one part of powdered white marble, white sand, powdered " quartz, felspar, or other substance of similar nature." The mixture having been carefully made, "the hydraulisating white " is prepared, and should then be packed so as to protect it from " the influence of the air or any humidity."

Colors "capable of being hydraulicised by their application " upon or admixture with the white" are ground with a paste composed of (1) chlorhydrate of zinc dissolved in a bath of equal parts of water and muriatic acid; after the dissolution of all the zinc that the bath can dissolve, "ten parts of water" are added, and "the zinc which has not been dissolved and the parts carbonised during this operation" are removed by filtering; (2) a dissolution of potash "rendered caustic by lime at $10^\circ/_0$, weighing " this salt, and in equal quantity of syrup of potatoes at $33^\circ/_0$, " weighing the liquor;" (3) four or five parts of pure water added to the mixture; (4) a loaf of sugar soaked therein and ground down " so as to obtain by its complete melting a liquor similar to " the thick oils used in oil painting;" (5) equal parts of wax soap. "The colors will be damped with pure water to facilitate " their mixture with the wax paste in nearly equal portions," and during the grinding there are added " a few drops of the com" position of syrup of potatoes and solution of potash." These prepared colors " are placed in impermeable varnish pots and then " diluted with pure water until brought to the same consistency " as those used in aquarelle or water color, or sepia painting."

The patentee describes his method of applying his white paint, " whether alone or mixed with the colors" for "all hard rough " paintings, such as woods, marbles, and house painting," and for "artistic painting in buildings, such as frescoes and all large " mural paintings."

[Printed, 4*d*. No Drawings.]

A.D. 1859, August 3.—N° 1789.

PEACE, William Kirkby.—(*A communication from Frederick L. Whiton and John W. Masury.*)—" An improvement in canisters

" for hermetically sealing paints and other substances." These canisters are so constructed " that they may be opened with facility " by using a penknife or other suitable sharp instrument." The body of the vessel is made, and the bottom is attached thereto in the ordinary manner; but instead of a material of the same tenacity and thickness for the top " thin brass or other soft metal " is employed, and a ring or rim thereof is soldered to the top of the vessel. For sealing the vessel after it has received its contents a disc of the same material as the body is used and soldered to the ring, leaving between the disc and the edge of the vessel " sufficient space for the passage of a penknife blade."

[Printed, 6*d*. Drawing.]

A.D. 1859, December 7.—N° 2771. (* *)

COLLYER, ROBERT HANHAM.—" A chemical ink pencil or " composition applicable as an instrument or means for writing, " drawing, and marking." This invention is the manufacture of a self-inking chemical pencil, that is, an instrument which, without requiring immersion in any fluid, will produce on paper marks as indelible as those obtained by ordinary pen and ink. The patentee sets forth the following eight formulæ which may be adopted for producing effective compositions for carrying out his invention; 1, nitrate of silver, anhydrate potassa, carbon, olive oil; 2, caustic potassa, nitrate of silver, steatite, carbon, olive oil; 3, caustic potassa or soda, nitrate of silver, fuller's earth, steatite, olive oil, carbon; 4, same as 3, but in different proportions; 5, caustic potassa, nitrate of silver, talcose slate, carbon, camphor, olive oil; 6, anhydrate of potassa, iodine, oxide of lead or litharge, vegetable carbon, steatite, pipeclay, camphor dissolved in oil; 7, anhydrate of potassa, iodine, vegetable or mineral carbon, nitrate of silver, steatite, pipeclay, fuller's earth, camphor dissolved in oil; 8, vegetable carbon, steatite, fuller's earth, nitrate of silver, iodine, caustic potassa and oil saponified, oil of tobacco, neat's foot oil. " Peroxide of manganese may be " added to any of the foregoing compositions in a proportion of " about $\frac{1}{10}$th of the whole mass to obtain increased hardness." Graphite or plumbago, lampblack, or other coloring or marking agent may be combined with the other ingredients to obtain visible marks before chemical action takes place. He gives certain proportions, but does not restrict himself to any, nor to the particular ingredients mentioned; he claims only the invention of the employment of "anhydrous potassa or other anhydrous substance "having such affinity for humidity as to absorb it from the "atmosphere or other source, and thereby become more or less "deliquescent in combination with oxide of silver or other material of such character that chemical action will take place "with it and the anhydrous substance on the latter becoming "deliquescent." The solid ingredients should be reduced to a state of the finest powder, each separately; they are to be then intimately combined, incorporated into a mass, and brought to the consistency of a thick paste; this, when nearly dry, is formed into crayons, leads, or other required shape, by forcing it into moulds by means of hydraulic or other pressure.

[Printed, 4*d*. No Drawings.]

A.D. 1859, December 8.—N° 2787. (* *)

ELLIOTT, Frederick Henry, and ELLIOTT, Charles Alfred.—"An improved method of preventing drawing boards "and other flat wooden surfaces from warping or twisting, and "of adding to the strength thereof." Circular boards, tables and panels are included in this invention. It consists in cutting a groove at each end of the board, "at right angles or nearly so "to the direction of the grain of the wood," and in laying therein a bar or strip of steel or iron (by preference of hardened steel). In circular boards and table tops a ring of steel or iron is let into a channel formed near the edge. "A veneer of the same material "as that of which the table top or board is made is laid over the "metal and lies flush with the surface."

[Printed, 6*d*. Drawing.]

A.D. 1859, December 24.—N° 2943.

SPILSBURY, Francis Gybbon.—"A certain translucent or "transparent fabric, and for certain applications of the same to "various purposes." This fabric may be employed "instead of "the ordinary tracing paper used by artists." The fabrics preferred are such as are "most translucent in themselves, such as "the finest tissue paper, muslin, skin, or perforated cardboard." A sheet of either is dipped into "a solution of silicate of soda or "potash, usually called soluble glass, either by itself or mixed "with phosphate, borate, or tungstate of soda or potash." The sheet when pressed and dried is ready for use, and is " the simplest " form " of the invention.

It is useful to give the sheets " a previous preparation," and sometimes for ornament or strength to " combine two fabrics " together." For the former purpose the sheets are oiled or dipped into " a strong solution of fat or resin soap," or into " a " solution of resinous matter in spirit or other liquid capable of " dissolving it." When the fabric is dry and has been dipped into the soluble glass, it is exposed to the air until the superfluous moisture is evaporated, and is then passed between rollers or subjected to other pressure. For the latter purpose the fabrics are brushed over with soluble glass, and " become incorporated into " one," by subjecting them to pressure.

[Printed, 4*d*. No Drawings.]

1860.

A.D. 1860, February 11.—N° 381. (* *)

COLE, Richard John.—" Improvements in the manufacture " of lead and other materials for pencils." By this invention the lead or marking material of pencils is rendered slightly flexible. The process of manufacture is as follows:—Lead or plumbago after being reduced to an impalpable powder is mixed with india-rubber in solution or other suitable adhesive material; for some purposes it will be desirable to mix therewith a small quantity of grease or other fatty matter. To this is added " a small quantity " of lampblack and finely powdered coke and charcoal; these " are thoroughly incorporated together and subjected to a great " pressure to divest the compound of any superfluous moisture, " after which it may be moulded in suitable lengths for use." Crayons or chalk pencils may be manufactured by substituting for india-rubber " fine gelatine or gum with the addition of a " little glycerine, to prevent the gelatine or gum getting hard or " crisp, and for dark colors a little charcoal finely powdered may " be used."

[Printed, 4*d*. No Drawings.]

A.D. 1860, March 31.—N° 832.

STELZL, ERNEST.—" Improvements in ornamenting surfaces of " glass, wood, plaster, and other materials, and in protecting " them from the action of fire and moisture." This invention relates to "fresco painting or coloring in distemper," and consists (1) in the production and application of a size or drier and of some alkaline silicate, (2) of a composition " which has the effect " of removing saltpetre from surfaces and thus facilitating the " application of the colors," (3) a method " of producing orna- " mental designs upon glass or other surfaces by the employment " of alkaline silicates."

1. 20 lbs. of cuttings of white skins are well boiled in 200 lbs. of water; after straining there is mixed therewith 2 lbs. of gum tragacanth previously dissolved in from 15 to 20 times its weight of water. " When this has been laid on, two layers of silicate of " potash are to be applied, the first being diluted with water " at ten degrees (Baumé) and the second at twenty degrees " (Baumé);" these two layers will render the surface " insoluble " and incombustible." Or " two or three preparatory coatings " and then "two layers of the same tint, ground with water and " mixed with silicate of potash at twenty-five degrees (Baumé)" may sometimes be substituted for the foregoing.

2. "To one quart of sulphuric acid at sixty-six degrees (Baumé) " add two gallons of water and one hundred grammes of crystallized " chloride of zinc;" the proportion of acid or of zinc may be varied. Two or three applications of this composition will be required, each being "allowed to sink into the wall as far as " possible."

3. To produce glass of any color or shade a layer of the color, ground and diluted with (by preference) " three parts of silicate " of potash at thirty-five degrees (Baumé), half a part of silicate " of soda at fifty degrees, and one part of lime water," is applied, softened down with a flat brush, and left to dry for a day or more. To produce " white designs standing out upon a blue, green, " yellow, or black ground, or pink upon lilac, and red grounds, or " white upon these various grounds," hydrochloric acid is applied to all those parts from which the color is to be extracted. The application and subsequent operations are described. Designs in lead pencil, chalk, or crayon may be drawn upon glass, " either " ground or painted, of any color by the process above de-

" scribed;" the glass is then coated with a "silicate liquor," and passed through an oven. Both sides of the glass may be " painted in different colors and designs." Photographs may be vitrified by being " treated with the silicate liquor."

[Printed, 4*d.* No Drawings.]

A.D. 1860, July 24.—N° 1793. (* *)

NEWTON, WILLIAM EDWARD.—(*A communication from Josiah Lyman.*)—" An improved mathematical or plotting instrument," denominated by the inventor " a protracting trigonometer."

"The improved instrument principally consists of a combination " of the protractor, draughting rule, and sliding vernier scale."

A semicircular protractor " is adopted to the pivot of a cross " bar" or **T** square; the blade of the **T** square forms the draughting rule and carries a scale plate and moveable vernier. " The " left-hand end of the draughting rule or straight edge projects " beyond the cross piece or head, and a vernier for the pro- " tractor is adapted thereto, so that lines at any angle to a base " or perpendicular may be laid down with facility, and when laid " down the distance between any two points on the land may be " measured by means of the scale plate and its vernier."

The Drawing shows a scale plate with six scales and a vernier to each scale, nine different units of division being used; the vernier guides and clamps are so arranged that the verniers can be applied " to either side of the rule, so as to read the given " angle and its complement in connection with the given distance, " or to be used separately." Each vernier has two adjusting screws; and the vernier guide has vertical grooves by which a needle point may prick off the desired distance. The instrument may be used either side up. " An exactly rectangular draughting " table is supposed to accompany the instrument, the length of " which table is to its breadth as six to five."

The use of the instrument, for the various purposes to which it may be applied, is described at length.

[Printed, 10*d.* Drawing.]

A.D. 1860, September 7.—N° 2162.

STEVENS, CHARLES.—(*A communication from Antoine Bouet.*) —" An improved impermeable oil varnish." This varnish " is " usually white and limpid;" it may be applied to many articles, and when prints, engravings, and oil paintings, are treated with it, "they may be rolled up without any danger of the varnish " cracking."

The ingredients and proportions employed in the composition of the varnish are "100 parts of alcohol, 100 parts of spirits of " turpentine, 1 part of sulphuric ether, and 1 part of carbonate " of soda."

[Printed, 4*d*. No Drawings.]

A.D. 1860, September 14.—N° 2232. (* *)

GEDGE, William Edward.—(*A communication from Jules Bénèche.*)—(*Provisional protection only.*)—" Improvements in ornamenting glass with colored designs or pictures, in imitation " of stained or painted glass."

The invention consists in the following processes:—" Produce " upon a sheet of transparent and colorless gelatinous matter, " either by lithography, or, if necessary, with the pencil or brush, " or by photography, any picture or design; spread this sheet " (coated with some transparent and colorless resinous preparation) upon a sheet of glass of equal dimensions; then apply a " new surface, composed of different pieces of sheets of coloured " gelatine, cut in accordance with the contour or outline of the " picture or design, and of the colours required by the subject to " be produced. When this last process is complete, the surface " is coated with the same resinous preparation as first used, and " covered with a second glass of the same size as the first. The " whole is then placed in a press, and shortly forms a solid and " unalterable body. Lithography, photography, and the brush " form the shades; the gelatine produces the tints and colours as " brilliant and as well blended as those of stained glass."

[Printed, 4*d*. No Drawings.]

A.D. 1860, September 15.—N° 2249. (* *)

BARNWELL, Stephen, and ROLLASON, Alexander.— " Improvements in combining and mixing certain solutions of " pyroxylene with animal, mineral, and vegetable substances, by " which its quality is altered in such manner as to produce hard, " resistent, adhesive, plastic, or resilient compounds and articles " unalterable in their nature, and varied in colour, which said compounds in a state of solution may also be advantageously

" employed as paints or varnish." The patentees make pyroxylene (by preference) from "common rags of any description, " plain or coloured," by submitting them to the action of "the " mixed acids, nitric and sulphuric," for from 20 to 24 hours. They obtain a useful description of the same article "by sub- " mitting fibrous and other matters containing cellulose to the " action of mixed acids of such modified strength and tempera- " ture that they will be only partly converted into pyroxylene." Both must be " freed from acids and dried before advancing to the " further processes."

The following ingredients "in character and proportion to be " governed by the special requirements of each case," are to be combined with the solution of pyroxylene:—Oils, essential, animal, vegetable, or mineral; gums, tar, bitumen, cements, wax, and grease; ivory and bone dust; powdered bark; farinaceous and amylaceous substances; and vegetable or mineral pigments and bronzes. Care must be taken that everything employed in the compound "be free from water."

There may be afterwards mixed with the compound india-rubber and gutta percha dissolved in chloroform and bisulphide of carbon, ether and alcohol, " all anhydrous basic salts that may " be soluble or that will in any way combine with the pyroxy- " lene," iodide of potassium and cadmium, and oxides of metals capable of imparting colour.

In making varnishes, lacquers, or cements, "the solution may " be mixed with a view to drying by heat or spontaneously."

The uses to which the patentees apply their invention are very numerous; those which belong to the present series are " varnish " for oil and water-colour paintings and a vehicle for pigments."

[Printed, 6*d*. No Drawings.]

A.D. 1860, October 11.—N° 2474. (* *)

WILLIAMS, WILLIAM MATTIEU.—(*Provisional protection only.*) —" An improvement or improvements in crayons for writing, " drawing, and marking." The essence of this invention consists in the use of magnesia, or the insoluble or nearly insoluble compounds of magnesia, whether natural or artificial, in the composition of crayons. The inventor prefers a mixture of calcined magnesia, finely powdered talc or steatite, white wax, and spermaceti or stearine, but does not limit himself to them or to any definite proportions. He fuses the wax and spermaceti or stearine, and incorporates therewith, by grinding or otherwise, the magnesia or magnesian compound, the requisite coloring matter being added either at the same time or afterwards. The composition is then moulded or cut into sticks or pencils. The crayons may be further hardened by the addition of resinous matter, such as copal, mastic, and Canada balsam.

[Printed, 4*d*. No Drawings.]

A.D. 1860, November 19.—N° 2835. (* *)

FORD, Henry.—(*Provisional protection only.*)—" Improvements " in coating or enamelling paper, pasteboard, cardboard, cloth, " silk, or other similar fabrics." The coating renders the material to which it is applied waterproof, so that anything written or drawn on it can be readily effaced by " the moistened tip of the " finger," or " with a wet sponge." Paper thus coated will be " serviceable as a substitute for the material known as asses' " skin," and pasteboard or cardboard so treated can be used " for " children's slates," while a cheap coated paper will " make an " excellent waterproof packing paper for needles, plated wares, " and steel goods." Artists also will find the coated paper useful " as a sketching paper." The ingredients of the coating are " one pint of methylated spirits of wine, two ounces of shell-lac, " one ounce of gum juniper, one quarter of an ounce of gum " mastic, and from one quarter to one half of an ounce of clear " resin." The proportions, however, may be varied. " The " gums and resins having been thoroughly dissolved in the " solvent, and the whole of the ingredients well amalgamated," the mixture is applied with a brush to the surface of the paper, &c. When one coating is dry another is laid on, and the coatings are repeated " until a sufficient body of the composition remains " on the surface." As soon as this is set hard, the sheet is placed between plates of metal and passed between " a pair of ordinary " paper pressing rollers."

[Printed, 4*d*. No Drawings.]

A.D. 1860, December 19.—N° 3119.

HENRY, Michael.—(*A communication from Bénoit Marie Alexandre Glénard and the Société Coignet père fils et Cie.*)—(*Provisional protection only.*)—" Improvements in the manufac-

" ture of colours applicable for various uses in arts and manu-" factures." These colours "are produced in a solid state, and " they may be combined with oil, varnish, size, or other vehicle;" they are suitable "for oil and varnish painting, for the manufac-" ture of crayons, and various other purposes." The colours are made from "mineral and earthy matters" which are adapted for the purpose by a process which the inventors call "animalization " or vegetalization."

"Gelatine or animal or vegetable albumen" may be used for rendering the matters capable of taking a dye. The matters are pulverized, "diluted in a solution of albumen, and brought into a " paste, which is dried." By this means "the mineral molecules " will be encased in a sort of albuminous varnish." The inventors do not confine themselves to this agent or method.

To manufacture bones into colours, they are subjected to heat or submitted "to the prolonged action of water in a digester at an " elevated temperature." They will be then "fitted for receiving " dye, and will take the reds and violets of aniline and various " others colours, and produce solid colours in those and many " other hues." Bones may be dyed by placing them whole or pulverized, hot or cold, in a solution of the dye.

[Printed, 4*d*. No Drawings.]

1861.

A.D. 1861, January 15.—N° 112. (* *)

STEVENS, CHARLES.—(*A communication from Mr. Loyer.*)—" A new paste made from wood to be used in the manufacture of " various articles, together with the apparatus employed in the " preparation of the same." Among the articles mentioned are " ornamental and other mouldings, furniture and imitation of " wood carving, panels for paintings, frames for looking-glasses, " pictures, and engravings." The preferable woods are soft woods, such as poplar, lime, birch, or fir; these are first reduced to shavings "sufficiently fine to be acted on with ease by a caustic " solution, in which they are boiled long enough to effect the " separation of the fibres." When sufficiently boiled "the fibrous " matter is withdrawn and subjected for several days to fermenta-

" tion for the purpose of softening and rendering it supple; this " is effected by exposing the lignum in a mass to the air and " watering it each day sufficiently to prevent its becoming dry " on the outer surface." It is now subjected to the action of a machine composed of (1) a cylinder of cast iron or other suitable material, on which steel blades are fixed at equal distances, and " shaped so as to slope on one side;" (2) a steel block " cut so as " to form blades having a sharp edge on their upper surface and " sloping on each side;" this block is placed in a receptacle " in " an oblique position to the axis of the cylinder," so that the contact between the blades " takes place only at one part." Various modifications may be introduced in the arrangement of the apparatus. " By means of this machine the fibres of the wood " are completely separated and form in a short time a fine " paste." Various roots can be used; they " are first bruised and " then boiled in caustic lye, and treated in the same manner as " the lignum;" but all knotty or defective parts must be removed before subjecting them to the action of the cylinder. Tan, either new or old, may be employed, but it must first be sifted, and all pieces too thick must be reduced in size. By mixing the paste with earthy matters and subjecting it to a rolling and pressing machine, it " becomes admirably adapted for floorings." Again, on being pressed and rolled to a suitable thickness the paste may " replace zinc and other materials employed at present for " roofing."

[Printed, 6*d*. Drawing.]

A.D. 1861, January 19.—N° 156. (* *)

CLARK, William.—(*A communication from Charles B. Wood.*) —" Improvements in compass protractors."

"This invention consists in the combination with ordinary " parallel rulers of a movable circle graduated as a compass, and " divided into degrees, if desired, in such a manner that by the " combined operation of said circle and the parallel rulers the " operations of laying off courses on board ship and of locating a " ship's position in a chart from cross bearings, and also the " operation of plotting a day's work (rendering it unnecessary to " keep a traverse table of corrected courses), and the operation of " ascertaining bearings between points, are greatly facilitated."

A pair of ordinary parallel rulers are connected to a graduated circle " by means of an arm being secured to the centre of said

" circle" by a screw pivot and nut. "The outer edge of the ruler " to which the circle is attached" is in "a direct line with the " centre of the circle." The nut clamps the circle when necessary.

If the east and west points of the circle are in a horizontal line, or in a line with the outer edge of the ruler, the circle represents a true compass. If the circle be turned to the right or left, in accordance with the variation of the compass, the circle represents a magnetic compass, and courses can be laid off accordingly. To find the magnetic bearing between two points, place the lower edge of the ruler upon them, and move the circle by opening the rulers until it is in the meridian; on correcting for variation the bearing can be read off from the protractor. The course and distance made good may be found by joining the first point of departure with the point which marks the distance on the last course, and referring the line so drawn by means of the instrument to the meridian line and lineal scale.

[Printed, 10*d*. Drawings.]

A.D. 1861, January 28.—N° 217.

CLARK, James.—(*A communication from Aloise Eydt Miller.*)— " The application of a paste of whatever wood to any kind of " ornamental and other mouldings, without the least admixture " of any other materials, or use of any chemical agent." The patentee applies his invention to the manufacture of picture frames and drawing boards, or panels for painting, as well as to a variety of other purposes. The wood is ground "on vertical or " horizontal grindstones, or by any other mechanical means (pro- " ceeding) under a constant admission of a small quantity of " water." Being now in a pasty state it is placed in a coarse linen or a fine wire cloth, so that the surplus water may run off, and then in a press to give it some consistency. The next process is to put it "under a vertical crushing stone to be ground," after which it is triturated and kneaded like potter's clay, and is then ready for moulding. The moulds are of plaster or other substance of a calcareous or argillaceous nature, so that the humidity of the paste may be absorbed during the moulding; but non-porous moulds may be used by washing the inside "with oil or " terebenthine." The drying of the moulded article "takes " place best at the common temperature and under cover; if " artificial heat be necessary, let it be moderate, and the drying

" must proceed but slowly." Rapid drying produces "splitting " warping, tearing, &c., &c."

For the sake of economy, plaster, China clay, or the like, may be mixed with the paste.

[Printed, 4*d*. No Drawings.]

A.D. 1861, March 9—N° 590. (* *)

DAVENPORT, Thomas William, and COLE, Samuel.—" Improvements in the manufacture of holders or handles for " pens, pencils, and artists' or painters' brushes." These handles are made of any material which will admit of being slit into thin strips and coiled up into a tapered or parallel tube or solid rod. The strips are saturated with any suitable adhesive mixture, and are then twisted up into shape. When the adhesive matter is dry, the coil is painted and varnished or decorated. A solid plug of wood is inserted, if requisite, into the thicker end to receive the pen or mount. The coil is made sometimes of two or more substances combined. When it is made of metal, very thin rolled strips are employed, cut at one end to a form capable of being manufactured into a pen or mount.

[Printed, 4*d*. No Drawings.]

A.D. 1861, March 20.—N° 706.

SCOTT, Simon Hart.—(*Provisional protection only.*)—" Im" provements in drawing instruments." The object of this invention is to give motion " at regular intervals, and to such " a guage or distance apart as may be desired " to instruments to be used "alone or in conjunction with other instruments " for producing linear drawings, or as an addition to drawing " instruments of various forms." One of the chief purposes for which the invention is to be employed is " the production of " a series of section lines or rulings for heightening the effect of " linear drawings." The inventor applies his invention in the following manner "for the purpose of giving motion to a set" square:"—He mounts a horizontal lever upon a fulcrum " either " at or near one end thereof or at about the centre of its length," so that it is free to vibrate "within the limits assigned to its " action by the projection or withdrawal of a regulating screw or " screws at the end or ends." Between the fulcrum and the screw at the longer end of the lever "a tumbler lever or foot

" piece" hangs down, "of such a length as to come into contact
" with the paper, T-square, or other fixed surface against which
" it is made to come in contact upon the longer end of the lever
" being depressed." He applies "a reacting spring to return
" the longer end of the beam upward" and "a spring to the
" shorter end of the tumbler lever" to enable it "to be returned
" to its normal position."

The fulcrum "may either be mounted upon a plate having
" a slot or groove therein to admit of the motor passing through
" it and the instrument to which it is affixed;" or by means of an arm projecting from the fulcrum the lever with its fittings
" may be made to overhang the instrument to which it is
" affixed."

[Printed, *4d.* No Drawings.]

A.D. 1861, April 2.—N° 813. (* *)

HURAY, Adolphe, & LEILÉ, Hermann.—" A new optical
" apparatus for reproducing & varying all sorts of drawings," which apparatus is called a "goniometroscope."

By means of this instrument "patterns, designs, flowers, lace,
" and other small objects can be multiplied and reflected at any
" given angle from a triangle upwards."

"The instrument consists of a case of wood, metal, or any
" other suitable material opening bookwise, the two sides or pieces
" forming the case being as closely connected as possible by hinges,
" leather binding," &c., "so as to form what we will call the
" back." The sides are each covered on the inside with a silvered copper reflector; these reflectors extend as near as possible to the hinge, so that, when the instrument is placed upon a horizontal object with the back in a vertical position, "the reflection is per-
" fectly made in the centre of the pattern." Screwed "at the
" top of one side of the case, at a small distance from the back,"
" is a half circle of metal or protractor," marked off so that the reflectors can be placed at any desired angle apart. The instrument is fixed to the pattern by means of vertical needles in the front of the case. "When not required the instrument can be
" closed and connected by means of a hook or other suitable
" fastening fixed at the front of the side; the protractor is also
" made to move back and so lay on the top of the case."

[Printed, *4d.* No Drawings.]

A.D. 1861, June 11.—N° 1490. (* *)

SMALL, Thomas Oswald. — (*Provisional protection only.*)— "An improved optical instrument for the use of designers and "others."

The instrument or "polyeidoscope" "consists principally of a "small box or case lighted by a moveable glass slide so arranged "as to subdue or give brilliancy to the designs. In this case is "mounted a roller capable of revolving and also of sliding to "and fro upon a central rod or wire. This roller may be either "white or black or colored, and is studded all over with small "pieces of metal, glass, silk, artificial flowers, beads, jewels, or "any other material used in any of the above trades. In the "front of the case opposite to this roller is placed a tube containing prismatic reflectors similar to an ordinary kaleidoscope, and "behind the roller is a radiated disc, each radial division being "of a different color or shade."

"Upon looking through the eye piece of the tube and turning "round the roller (by means of a button outside the case) the "most beautiful designs will appear in rapid succession, any one "of which may be arrested till copied or reproduced, and by "turning round the radiated disc the effect of variously colored "backgrounds on the same design may be tried; by sliding the "roller to and fro any part of the roller may be brought to view, "and by turning round the tube the form of the design may be "changed, so that an almost endless variety of designs and effects "may be thereby produced."

[Printed, 4*d*. No Drawings.]

A.D. 1861, June 11.—N° 1492.

HARDING, James Duffield, and WINSOR, William Henry.—"Improvements in drawing materials and apparatus "for the use of artists." These improvements are intended to render more effective "drawings in black lead, black and white "chalk, or like materials."

1. The lead or chalk is made up in the form "commonly known "in the trade as tablets;" this tablet is held in a suitably constructed clip, and it is not cut to a point, but is ground on a file to an edge varying with the wants of the artist.

2. The clip is formed of a metal tube, split at one or at both ends and somewhat flattened, so that it may bear well on the

sides of the tablet; it carries a slide provided with shoulders "which project forward" and serve to support the tablet edgewise.

3. The file is fixed "in an inclined position" in a box; and on the inside of the lid of the box is a pad for the reception of the superfluous dust remaining on the filed edge of the tablet.

4. An improved stump consists of an elastic foot of horn, whalebone, vulcanite, or other elastic material, covered on its under side with soft leather. This foot is secured by wire thread or otherwise to a handle "of a slightly curved or other suitable "shape;" it is charged with the pulverized lead or chalk on the pad.

[Printed, 6*d.* Drawings.]

A.D. 1861, July 9.—N° 1737.

PENLEY, Edwin Aaron.—(*Provisional protection only.*)—"Improvements in the construction of drawing boards," so that sheets of paper may be strained upon them without using glue or other cement. "An acute angular channel" runs round the back of the board a short distance from the edge, and "wooden flaps" are hinged on to the back, provided with angular strips of wood which fit the channels. The entire sheet becomes tightly strained by turning over its edges from the front and pressing the flaps down on them. Beneath the flaps may be metal pins or pegs to which the edges of the sheet may be hooked before pressing down the flaps.

[Printed, 4*d.* No Drawings.]

A.D. 1861, November 1.—N° 2746.

SMITH, Andrew.—(*Provisional protection only.*)—"Improve-"ments in producing or delineating ornamental lines and figures "on metal and other surfaces." This invention relates to the application of a ruling machine, "the invention of William Smith, "for which British letters patent, dated 14 day of November 1853, "No. 2639, were granted to him;" and the new application consists "in operating with a cutting point in "place of a mathe-"matical pen." The articles to be ornamented are fastened down in the ordinary way "upon that part of the machine called the "carriage," and the workman "proceeds to produce straight or "waved lines by using the cutting point." The surfaces so ornamented are to be either gilt or plated. The inventor " designates this style of ornamentation Scoto-damascene work."

[Printed, 4*d*. No Drawings.]

A.D. 1861, November 21.—N° 2924. (* *)

POLYBLANK, George Henry.—(*Letters Patent void for want of final Specification.*)—" A new or improved method of protecting " and preserving photographic and other prints, water-color " drawings, and other works of art from injury and decay."

" If the paper, material, or fabric upon which the print or work " of art has been produced be of such a nature as to absorb the " preserving or any liquid put upon it, I first saturate the material " or fabric with some clear size which will not injure the work of " art printed or otherwise put upon it, and when the sized print " or work of art is dry I press it, when necessary, in order to " make it flat and level, and it is then ready for the next process. " I take the print or other work of art to be preserved, either " previously sized or not, as may be necessary, and entirely coat " it with paraffin, made fluid by means of heat so as to be capable " of being spread over the print or work of art without injuring " it. The coating is then to be allowed to set or become dry, and " the covering thus put upon the print or other work of art will " protect and preserve it from injurious effects of atmospheric " and other influences."

[Printed, 4*d*. No Drawings.]

A.D. 1861, December 9.—N° 3084. (* *)

BROOMAN, Richard Archibald.—(*A communication from Humblot Conté.*)—(*Provisional protection not allowed.*)—" An im" provement in black-lead pencils." The invention consists " in " forming the black lead or composition used in making black" lead pencils of any thickness and shape desired, and in dis" pensing with the wooden or other casing, whereby effects " hitherto unobtainable by lead pencils may be produced."

[Printed, 4*d*. No Drawings.]

A.D. 1861, December 10.—N° 3092. (* *)

STANLEY, William Ford.—(*Provisional protection only.*)—" The use of aluminium for the construction of mathematical " instruments used for geometrical drawing, surveying, and " nautical purposes, and improvements connected therewith."

"The metal aluminium, or its alloys, is to be used as a material
" for making all or such parts of mathematical instruments as
" the construction may be suited for. By the term mathematical
" instruments, I intend any instrument to measure mathematically
" levels, altitudes, circles, bearings, and lines, or an instrument to
" set out or draw the same on land, chart, or paper, technically
" known as theodolites, levels, circumferenters, sextants, quad-
" rants, mining dials, magnetic and prismatic compasses, drawing
" compasses of all kinds, scales and rules, or any other instrument,
" used to measure mathematically, by whatever name it may be
" called. Improvement in the construction of sector and knee
" joints used in mathematical instruments, in this case rendered
" necessary by the softness of aluminium, is to make the centre
" plate of thin steel fixed to what is technically called the head
" side of joint, and to have a steel washer loose between each of
" the other parts of the joint, where the two surfaces of aluminium
" would otherwise come in contact. This improvement is claimed
" if applied to other metals."

[Printed, 4*d*. No Drawings.]

A.D. 1861, December 12.—N° 3115. (* *)

WILEY, WILLIAM EDWARD.—"An improvement or improvements in pencil cases and holders for crayons and other solid writing or marking materials, which improvement or improvements may also be applied to crochet needle holders." The body of the case is a tube having a straight slit nearly from end to end. The head has a collar on which the upper end of the tube is sprung; and a groove in the tube engages with the collar, so that the head is capable of rotating. The screw, in which the propeller works, is a helical coil of wire soldered or otherwise fixed at one end to the head; the propeller (a tube) slides in the slit by means of its hook. The rotatory motion may be obtained from the nozzle instead of the head. In this arrangement, the head of the case is closed and the end of the coil is fastened to the nozzle, which is attached by the serrated end of the case being burnished into a groove in the same. Crayon holders are made on the same principle, but of larger size. In crochet needle holders the unhooked end of the needle is permanently fixed in the propeller.

[Printed, 8*d*. Drawing.]

1862.

A.D. 1862, January 28.—Nº 214. (* *)

TREPPASS, Henry Hughes.—"Improvements in the con-
" struction, use, and employment of the kaleidoscope."

1st. "An object box, which is an open one, allowing the objects
" to be changed or arranged by the fingers or otherwise, and
" may be turned at pleasure to or from the light, and may have
" a reflecting background, or a background of any colour or any
" variety of colors."

Between the ordinary kaleidoscope reflecting tube and the object box, shadow or other slides may be passed.

2nd. "The objects employed to produce the images" may consist of coloured paper, fabrics, natural objects, &c. The effects produced are of light, shade, perspective, transparency, and relief, the reflecting background assisting the last three effects.

3rd. To obtain permanent images, plaster casts are arranged upon and attached to cards, which "may be placed in the instru-
" ment or withdrawn at pleasure, still retaining their fixed
" patterns or designs." To vary the images the cards may have a slow rotary motion.

4th. "Lenses may be used in connection with this instrument,
" so as to project an image on a suitable surface, as by a camera,
" which image may then be photographed, thus readily securing
" designs whenever desirable."

5th. "The instrument may be constructed of tin, papiér maché,
" fancy wood," &c. plain or highly ornamented, "and may be
" mounted on a stand when desirable."

The Drawings show the various parts of the instrument and its uses. The object box is represented of the shape of a hopper and triangular in vertical section; the upper opening is square.

[Printed, 10*d*. Drawings.]

A.D. 1862, March 8.—Nº 627.

WILKINS, William Noy.—(*Provisional protection only.*)—
" Improvements in the manufacture of pigments of oil and water
" colors." These pigments (white) are intended "to supersede
" white lead and other pigments now used by painters, decorators,

" artists, and others in laying on color on pictures, wood, stone, " and other materials."

A white pigment for oil painting is composed " of equal parts " of white oxide of zinc and plaster of Paris, chalk, or any white " aluminous earth, such as kaolin and pipe clay." The inventor does not limit himself to these proportions " as a third or even " less of the white oxide of zinc with plaster of Paris will give a " brighter result though more difficult to work with the brush."

A white pigment for water colors is made " by mixing plaster " of Paris with size or glue in proportions according to the " consistence that may be required."

The pigments are ground and mixed by means of the ordinary machinery for such purposes.

[Printed, 4*d*. No Drawings.]

A.D. 1862, March 10.—N° 640. (* *)

BROOMAN, Richard Archibald.—(*A communication from Arthur Guy Morvan.*)—" Improvements in producing by the aid " of photography copies of maps, charts, plans, and drawings."

1. Obtaining a positive image on cloth, paper, or glass, " without " the aid of a negative."—A tracing of the design, on transparent drawing cloth, is placed in contact with the sensitized paper, or other surface, the face of the design being next to the sensitive surface; the frame containing this arrangement is exposed to the action of light, and the image is fixed and finished in the usual manner. The sensitizing solution described in the Provisional Specification contains iodide of silver, that set forth in the Final Specification contains " azotate " of silver.

2. Transferring the design upon the transparent cloth to stone. —The stone is prepared with acid, washed in water, dried, coated with a sensitive varnish, allowed to dry, and exposed to the action of light; it is then washed with white wine, with water, allowed to dry, washed with soapy water, again washed, " and then dried " in a stove or otherwise." Ink is then applied; the stone is allowed to rest 24 hours, and washed with essence of turpentine. Again ink is applied, and the subsequent inking operations are facilitated with phosphoric acid and gum, so as to bring out the design; impressions may then be taken from the stone. By this process the stone gives off positive impressions. The varnish contains white of egg and bichromate of ammonium, and those

parts exposed to light become more or less insoluble. The ink first used contains transfer ink and lithographic crayon, that employed the second time consists of transfer ink and phosphoric acid.

[Printed, 4*d*. No Drawings.]

A.D. 1862, March 17.—N° 733.

DAVIES, GEORGE.—(*A communication from Joséphin Soulary.*) — (*Provisional protection only.*) — "Improved apparatus for "drawing." The apparatus which the inventor proposes to call a *stytograph* is constructed as follows:—A groove is cut at the top and bottom of a drawing board "at the edge of the "wood," and two horizontal rods of metal are inserted therein "and fixed at each corner to supports by means of a small screw, "but so as to leave them a certain amount of play." On these rods are two small guides of brass "soldered to a piece of the "same metal in which are placed upright two vertical parallel "rods." "In the centre of these rods moves up and down a rod "sliding above in the piece before named, at the top of which is "placed a style intended to follow the contour or form of the "object to be drawn. A small cap in which the lower end of "the last-named rod is fixed (and which itself forms a slide on "the two vertical rods) carries the pencil, which by means of a "rack can be raised at will." The style is fitted to a support at a distance from the moveable rod; "it slides telescopically therein "and can be raised and lowered at pleasure." An eye-piece "mounted on hollow rods of brass sliding one in the other or on "thin blades of brass completes the apparatus."

There are "two metrical scales, one placed against the upper "face of the board in the direction of the horizontal rod and the "other on the upper vertical rod, which is itself graduated on the "decimal system, or parallel to this rod on a metallic band fixed "at the two ends above and below the vertical apparatus." A moveable index "on the upper sliding tube allows the pencil to "mark on the horizontal scale, whilst the edge of the pencil cap "itself forms an index on the vertical scale."

For taking panoramic views the instrument is arranged as follows:—rollers of light wood are fitted on supports above and below to one side of the board; they revolve by means of a crank provided with a ratchet wheel; they are "divided into two pieces

" connected together by metal rings, and between the joint of " these two pieces the ends of the sheet of paper are placed." The instrument " is mounted on a foot capable of turning." If desired " a small mariners' compass " may be added.

" With slight variations " the instrument may be employed for " drawing or etching on stone or metal."

[Printed, 4*d.* No Drawings.]

A.D. 1862, March 19.—N° 767.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Charles Raphaël Maréchal and Cyprien Marie Tessié du Motay.*)— " Improvements in printing and painting upon glass and ceramic " wares, and upon metallic and mineral substances, also in the " preparation of inks and colours for printing and painting." The first part of this invention " comprises four processes." 1. A design engraved on wood, stone, or metal, is printed upon paper " in fatty ink," after which it is transferred to glass " and " constitutes the reserve ;" then " the metallic silicates or oxides, " which after firing are to shew the impression," are applied with a pencil or brush. In order that the silicates, &c. " may adhere to " the glass, and at the same time be insoluble in solvents of resinous and fatty bodies which compose the fatty inks," they are mixed up " with a solution of gum dextrine or other similar " organic substance," and are desiccated. " The fatty reserve is " next dissolved either in sulphuret of carbon or in hydrocarbons, " or other similar solvents." " The vitrifiable oxides and metallic " colours " remain fixed upon the glass, " and are subjected in " muffles to the fire."

2. This, " the counterpart of the first," differs only in that the printing of the reserve is effected in thin inks. The vitrifiable oxides and metallic colours " are fixed and applied in the hollows " and interstices of the reserve with fatty or resinous bodies " insoluble in water ;" and as the reserve is soluble in water, a " similar end " to that arrived at by the first process is obtained " by simply reversing the substances employed."

3. This consists in printing the design upon paper in a fatty ink " containing combined with it oxides, carbonates, alumino- " silicates, or alkalino-terrous sulphates, earthy or metallic, and " little or not at all vitrifiable at the temperature at which glass " fuses." The design is transferred to glass and forms the

reserve; into its hollows and interstices vitrifiable metallic oxides or colours are applied in either a damp or a dry state; firing then takes place, the articles are allowed to cool, and "the non-"vitrifiable bodies" are removed with a brush by hand, or by acids.

4. This is "the counterpart of the third, in that the reserve is "printed in thin ink."

The inks and colours mentioned in the second part are prepared so as to have the properties, "1st, of containing in themselves "the vitreous fluxes, enamels, metallic oxides, inorganic colo-"rants, and organic bodies, serving directly, whether for painting "upon glass, porcelain, metals, and other substances, or for "printing upon paper, and for transfer to these substances; "2nd, of allowing of the substances combined, mixed, and con-"tained in them, uniting under the action of fire with the bodies "on which they are applied."

"A borate, a silicate, or a phosphate, neutral or basic, and such "that the base is capable of forming a soap or paste, acid or "neutral, with fatty acids or acid resins," is placed "in presence "of boiling water" for one or more hours in contact with "acid "fatty bodies, acid resins, or mixture of such acid bodies and "resins, until there are produced at the same time a silicate, "a borate, a phosphate, and a soap, which remain united and "form a new composition;" the combination may be obtained "under heat without the presence of water." The composition is weighed, and "after deducting the equivalent of fatty acids, "or of acid resins combined with the silicates, borates, or phos-"phates," it is mixed in various proportions with enamels or metallic oxides. The mixture is ground and triturated, and "essential oils, hydrocarburets, solutions of resin in essences, or "hydrocarbets, or oils of resin, or of galipot," are added thereto for the purpose of imparting "the necessary degrees of plasticity, "viscosity, and limpidity."

[Printed, 4*d*. No Drawings.]

A.D. 1862, April 4.—N° 961.

HALE, Alfred Joseph.—(*Provisional protection only.*)—"Im-"provements in instruments for drawing ovals." The upper portion of a pillar or stem ("the principal part and support of "the instrument") revolves freely within a tube, which rests on a bracket jointed to the pillar. At the back of the bracket is fixed an arm inclining upwards, and in front is jointed a limb inclining downwards. On the upper portion of the limb is a quadrant piece which passes through a slot in the bracket, and is fixed in position by a thumbscrew, "according to the radius of "the figure to be described." The lower portion of the limb is provided with a sliding tube which carries the drawing instrument; the slide is controlled by a link that connects the tube to the pillar. On the first-named tube is an oval piece of metal, against whose periphery the upward inclining arm is constantly pressed by a spring. The oval piece can slide on the tube, but it is prevented turning thereon by a feather; it is fixed "in any "position of elevation within its limits" by a screw. "According "to the position of this oval so will the oval described have "greater or less length in proportion to its breadth;" the size of the figure described is regulated by the down-inclining limb and thumbscrew.

[Printed, 6*d*. Drawing.]

A.D. 1862, May 23.—N° 1557. (* *)

WILEY, WILLIAM EDWARD.—"Improvements in the manufacture of certain kinds of penholders, which improvements may "also be applied to pencil cases and holders for crayons and "other solid writing or marking materials." This invention relates to the penholders called orthodactylic, and consists, first, in making the thumb and finger plates from one piece of sheet metal joined together by short strips. "The middle finger plate "is afterwards bent into a plane at right angles to the other two "plates," and the set is then ready for fixing to the penholder. The fastening is effected by tongues on the plates engaging in piercings in the holder, and fixed with or without solder, or by soldering the plates without tongues. Secondly, in fastening the plates, when each is made separately, by means of tongues as before described; or "the top and bottom plates may be fixed by "a tongue on one end of the plate engaging in a piercing in the "holder, and a pierced projection on the other end of the plate "engaging with an ear on the end of the holder." The patentee applies the plates, made in either way, to pencil cases and crayon holders, &c.

[Printed, 6*d*. Drawing.]

A.D. 1862, July 23.—N° 2093.

KEENE, Charles Joseph.—"A new or improved winding "apparatus for raising and lowering canvas on easels." The patentee describes an easel and a winding apparatus attached thereto. The outer framework consists of two uprights provided with cross bars and feet furnished with castors. The inside of each upright is grooved to admit of a slide which carries the rest-board whereon the picture is placed. On the rest board is hinged a frame against which the picture is held by a spring. The spring is fitted to a piece of metal that slides within a narrow frame (which also slides in the hinged frame). The hinged frame is furnished at top "with one or more compass joints or quadrants." By such arrangements a picture of any size can be accommodated and be placed at any angle.

The winding apparatus is composed of a rack, and a crown wheel geared by a pinion on a worm, the teeth of which take into the rack. The rack is fitted to a vertical bar which is fastened to the cross bars. The crown wheel is fixed at the back of the rest-board and is actuated by a key or handle in the front of the rest-board by means of a spindle.

Two bevel wheels may be used instead of the crown wheel and pinion.

[Printed, 8*d*. Drawing.]

A.D. 1862, August 9.—N° 2235.

DE LA RUE, Thomas.—"Improvements in the manufacture of "pigments and writing inks." For these purposes put 1 oz. of gum tragacanth into 1 quart of water, and let it "stand some "days." When the gum is softened, put in 10 oz. by measure of glycerine, and stir the compound well. Grind with this mixture the best lampblack "or other proper form of carbon," adding it from time to time "until a paste of the consistence of strong "printing ink is obtained." Then add a solution of salep or gluten or glutinous substance in acetic acid; the solution is composed of 20 oz. by measure of water, 8 oz. of a strong and clear solution of salep (1 oz. of ground salep to 1 pint of water), 16 oz. of vinegar, and 28 oz. of a solution of gluten in vinegar (3 oz. of dry gluten to 1 quart of vinegar). The vinegar employed is "the "*strongest* commercial pyroligneous acid diluted with six times

" its bulk of water." Isinglass dissolved in acetic acid may be used for gluten, and other gums for gum tragacanth.

The patentee produces a pigment from " the black bye-product " or waste substance obtained in the manufacture of aniline;" this is ground with " glycerine prepared as above described," and is rendered fluid for use by the addition of a solution of salep or gluten or glutinous substance dissolved in acetic acid.

" For artists' water-colors it is more convenient to send the " product into the market in the form of a paste produced as " above described." The user will reduce the paste by the addition of a solution of gluten in vinegar.

[Printed, 4*d*. No Drawings.]

A.D. 1862, August 14.—N° 2283.

WELCH, George.—" Improvements in inkstands, metallic pens, " and penholders, and other instruments and appliances used in " writing and marking." The specification contains inter alia a description of " sliding penholders, combined penholders and " pencils, and combined penholders, pencils, and india-rubber."

The pens are made with " a corrugated spring tongue " fixed on the back of the rib, or with a coil of wire on the concave side, or with the side flaps " turned back nearly against the under or " concave side." The penholder is " an open-jointed tubular " holder;" it is sprung upon the handle (which is either an ordinary pencil or an ever-pointed pencil case), and is capable of sliding thereon. At the upper end of the handle is a piece of india-rubber held in a spring metal tip by a rivet. " A " sliding cap may be used for covering and uncovering the india- " rubber."

A pocket penholder or pencilholder consists of an outer tube formed with a longitudinal slot and an inner tube capable of rotating and cut with a spiral slot. The pen is carried by a tubular piece provided with a stud which engages in both slots. In the pencilholder " an ever-pointed pencil is used in place of the pen " and tubular piece."

[Printed, 1*s*. 6*d*. Drawings.]

A.D. 1862, September 29.—N° 2643. (* *)

HIRSCH, Hermann.—" Improvements in apparatus for showing " combinations of colors."

"My improvements apply to apparatus for showing combi-
" nations of different colors by the rapid rotation of bodies
" variously tinted. I prepare discs or plates of paper, card, wood,
" metal, or other suitable material, the surface of each of which
" I color with various tints, and I bore two small holes through
" each of these discs or plates near to its centre, and I pass
" through these holes two threads, strings, or cords of convenient
" length, so that their ends being tied to rings or other suitable
" bodies for holding in the fingers can be held in the hands of
" operator at some distance apart. By moving or swinging the
" hands so as to give the discs or plates a revolving motion the
" threads, strings, or cords are twisted round each other, and
" then by alternately slackening and tightening them by moving
" the hands near together or further apart, the threads, strings,
" or cords are alternately twisted and untwisted, and give to the
" discs or plates rapid rotary motion alternately in opposite
" directions, so that the colors thereon appear to be blended
" into various tints or shades of combined color."

When variations of pattern are to be produced, a piece of coloured card, which has its corners turned up, is employed. When this is placed upon the pin of a wooden centre piece made with two holes for the reception of the cord described above, the turned up angle pieces of the disc "encountering resistance from
" the air cause its rotation to be retarded, and to be accompanied
" by a rapid vibratory motion, which has the effect of varying the
" colors and forms of the patterns produced."

[Printed, 8*d*. Drawing.]

A.D. 1862, September 29.—N° 2645.

ELLIS, HENRY.—"Improvements in the manufacture of com-
" pounds of silica, and in the application of certain compounds
" of silica to mineralize woven fabrics, paper, and paper pulp, to
" harden and preserve stone and cement, in the production of
" artificial stone and paint, and in the production and glazing of
" porcelain and such like manufactures." The patentee manufactures by aid of prepared compound silicates (inter alia) "lignolite
" tracing paper," tracing linen or fabric, "lignolite" suitable for writing tablets or drawing paper, and pigments for porcelain and enamelling.

Compound silicates are precipitated "out of solutions of
" silicate of soda or of potash by means of solutions of any of

" the salts of the metals or of the earths;" they are then strained and washed, and "while recently formed or in the gelatinous " state," they are redissolved "in as much as may be sufficient " for a solution of silicate of soda or of potash, or of both." If the silicates have become dry the mixture is heated up to the boiling point "to facilitate their solution." All gelatinous silicates " may be made soluble in the above manner and by the addition " of carbonates of soda or of potash." Coloured earths and oxides of metals may be added for the sake of the tints.

The tracing paper and the tracing fabric are made by applying with a brush or other contrivance to ordinary tissue or other thin paper or to thin fabric a solution of the prepared compound silicates "thoroughly saturated with any gelatinous silicate."

The tablets and drawing paper are made by applying in a like manner to paper or cardboard a like solution "supersaturated to " such a degree" that it shall have assumed "an opalescent " appearance." The patentee prefers paper or cardboard "largely " combined with mineral matters," in the proportion of 25 parts of the mineral to 75 of paper pulp, the mineral matter to include from 1 to 10 parts " of an earthy or metallic carbonate."

Other solutions and their preparation are described in the Specification.

[Printed, 6*d*. No Drawings.]

A.D. 1862, October 25.—N° 2876. (* *)

NICHOLSON, JOSEPH ALFRED. — " Improvements in lead, " crayon, and other pencils." These improvements consist in forming grooves, longitudinally or otherwise, from end to end in the woody portion of lead or chalk pencils in order to render them more easily pointed. The wood is grooved with several angular grooves by means of rotating cutters or saws or drills or by planing, ploughing, or otherwise. For grooving crayons, slate and other pencils, which are not enveloped in a wooden case the superfluous substance is removed by cutters or drills revolving at a rapid rate, whereas ordinary lead pencils are most readily grooved by forcing them through a die having a series of cutters " which plough, plane, or scoop out the several grooves simul- " taneously." In the specification is given a detailed description of the apparatus by which the operation is performed; but as the patentee claims as his invention only " forming pencils with

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" grooves throughout their length in order to have less material " in the pencil, but with the same or nearly the same diameter as " heretofore," it is deemed unnecessary to describe it here."

[Printed, 8*d*. Drawing.]

A.D. 1862, November 4.—N° 2980. (* *)

LOGAN, THOMAS.—(*Provisional protection only.*)—" An im-" proved kaleidoscope."

The kaleidoscope is mounted on a stand, with the eye piece upwards, so as to be capable of revolving on its axis. A reflector is attached to the said stand, and is " mounted on pivots so as to " be capable of being placed at a suitable angle to reflect the " light into the kaleidoscope." The tube is made to taper; inside the tube are three reflecting glasses " blacked or silvered " at the back and arranged in an equilateral triangle." At the lower end of the tube " are two circular glasses, one plain and " the other ground, between which are placed loosely pieces of " broken glass, cut stones, or other objects." The stand the inventor makes " in wood of an oval form, having two pillars, " near the upper end of which is fixed a ring, in which the tube " of the kaleidoscope is mounted (at an angle of about thirty " degrees from the perpendicular) so as to be capable of revolving " on its axis." A circular reflector of silvered glass, " about three " inches and a half diameter, is mounted on pivots attached to " the stand in front of the pillars, and beneath the lower end of " the kaleidoscope. The stand being placed upon a table, and " the reflector so arranged as to throw the light into the instru-" ment, upon looking through the eye piece and turning round " the tube slowly the most beautiful effects are produced."

[Printed, 4*d*. No Drawings.]

A.D. 1862, November 5.—N° 2997.

NEWTON, ALFRED VINCENT.—(*A communication from Paul Schulze and Frederick William Billing.*)—" A new process of ob-" taining printing surfaces, dies, and substitutes for photographic " negatives." The part of this invention which belongs to the present series is the obtaining by drawing, without the aid of a camera or the agency of light, substitutes for photographic negatives, " which may be printed from in the same manner as those " negatives by the action of light acting through them upon " sensitive paper." A drawing is made " in ink which is soluble

" in water " on a plate of finely-ground glass, and is then thinly coated with a composition of beeswax, asphaltum, resin, and fine lampblack. The plate is then subjected " to the soaking and " washing operations " to remove the ink, and when it is dried, it is dusted over with lampblack "to make the ground still less " transparent ;" after this " the whole surface has applied to it a " coat of alcoholic varnish." When the varnish is dry, " the " plate is used for printing on upon prepared paper in the same " manner as a photographic negative obtained by the camera."

[Printed, 4*d*. No Drawings.]

A.D. 1862, November 22.—N° 3140. (* *)

GEDGE, William Edward.—(*A communication from Pierre Jacques Carmien.*)—" An improved elliptical compass."

A stand or " foot " carries a support which is adjustable in height ; a " horizontal piece " rests on the support, and is capable of being placed at various inclinations, according to the breadth of the ellipse. The length of the ellipse is determined by a " branch " sliding in a " turn-piece " that turns in the " horizontal piece." The pen is connected to the " branch " by means of intermediate " hinges " and " triangles," so that when the " turn-piece " at the apex of the instrument is moved round, the pen partakes of the motion of the said " turn-piece " controlled by the " hinges," " triangles," and adjustments of the " branch " and " horizontal piece." The pen is maintained perpendicular to the plan, during the whole of its traverse, by means of a flat " pivot " hinge in which its stem turns.

The instrument is placed upon the paper in the desired position by means of a " T-shaped " piece pivoting on the " foot," the said " T-shaped " piece being furnished with two points for that purpose. By means of the pivot, this piece can be raised to give passage to the pen, so that the whole of the circumference of the ellipse may be traced. The arrangement of the " hinges " and " triangles " is such that the pen is " always in the proper " position to trace the lines, no matter how curved."

Means of raising and adjusting the pen, and of tracing " several " circular or elliptical lines parallel and near to each other," are set forth.

[Printed, 8*d*. Drawings.]

1863.

A.D. 1863, January 13.—N° 102. (* *)

BOYLE, Thomas.—(*Provisional protection only.*)—"A new "apparatus for multiplying indefinitely the reflections of all "objects that are capable of being viewed in it."

"My invention consists externally of a tapering wooden box "narrow at the bottom and wide at the top or mouth, or vice "versa, formed by sides inclining outwards or inwards, as the "case may be, from the bottom at indefinite angles according to "circumstances. The circumstances on which the angles of the "sides depend are the curves of certain glasses to be fitted inside, "and which may vary according to the effect intended to be "produced. The interior of this frame is fitted with reflecting "glasses varying in shape, and either flat or curved, or more or "less in number, as the case may be, and which stand towards "each other at suitable angles for producing the various effects "intended."

"A definite example of the arrangement of curves and angles "here alluded to is that of a convex reflecting bottom glass "curved to a diameter of about nine inches, fitted with four "reflecting sides standing in relation thereto, two at about five, "and two at about ten degrees of outward inclination. This "gives the effect of many hundred repetitions of reflections of "any object that is capable of being viewed in it. In front of "the open top or mouth of the apparatus there is provided "a suitable holder, removeable at pleasure, on which certain "objects that require it are placed to be viewed."

[Printed, 4*d*. No Drawings.]

A.D. 1863, January 26.—N° 226. (* *)

STANLEY, William Ford.—" Improvements in mathematical "drawing instruments."

1st. A "compass for describing circles or arcs of large radius." Two legs are jointed to the end of a bar; they are fixed at a given angle to each other by means of two converging stay rods, the upper ends of which are fixed to a slide adjustable in a groove cut in the bar. The legs work through two centres fixed on a cross bar, and a head at the end of the principal bar carries the pen. A fixed angle is thus "moved upon two points," and "the " angle describes a portion of a circle."

2nd. A compass for describing a circle by means of the centre. The points of the compass are held erect "by means of converging " or crossing stay rods attached to the two points or sides of the " compass."

3rd. A "compass or spring bow for describing small circles." To preserve "the points of the bow erect," "the legs are double " or knee-jointed," and a milled-edged nut, mounted in one of the legs, works on a screwed bar fixed in the other leg of the bow, below the knee joint.

4th. A method of mounting the needle points of the above-mentioned instruments. A small bolt, with a hole in its extremity, passes transversely through the leg of the compass; the needle point is passed through the hole and held firmly by means of a milled nut that screws on to the bolt.

5th. A "method of making a needle point recede by pressure " up the leg of a compass." "Forming a hole up the point of " the instrument, in which hole a needle or bolt is placed loosely, " so that by pressure on the point of the needle the needle will " retire up the hole;" the needle is pressed forward by a helical spring.

[Printed, 8*d*. Drawing.]

A.D. 1863, January 28.—Nº 256.

CLARK, WILLIAM.—(*A communication from François Willème.*) —"Improvements in the means and apparatus for copying and " reproducing sculpture and other objects of art." The inventor calls his process "photo-sculpture," it being based "on the " employment of photography in connection with the pantograph."

The model is placed in the centre of a ring, which is furnished with object glasses "placed at equal distances apart, at the " same height," or with "dark chambers in which the model " may be delineated." The number of glasses "generally con- " sists of from twenty to thirty," but in the Specification the inventor refers to four only; one "photographs the face, the " opposite one the back, the other two the profile; all are taken " at the same moment and in the same position." The material to be sculptured is placed on a revolving platform which is "divided into as many parts as there are object glasses or photographic proofs," and is "capable of assuming all the positions "corresponding to those of the views of the subject." Two tablets are used at one time; the one has on it the photograph of the face, the other that of one of the profiles; they "are so "applied as to approach or recede from" the platform, the motion being regulated "by the form of the sculpture to be "produced," and they "are traversed together with the photographs by one or several horizontal and vertical lines" in order that "the photographs shall have positions corresponding exactly "with each other." Two pantographs are generally employed "acting at right angles on the material to be sculptured," and if the material is hard "drills, scrapers, or pointers of greater "hardness" are substituted for the ordinary pantograph points. The inventor describes his method of operating, and the changes required for producing bas-reliefs, caricatures, round grotesques, and counterparts.

For sculpture of "a colossal size" he uses "a solar microscope "or other known means for enlarging photographic proofs" and substitutes for the tablets "the vertical plane which receives the "enlarged photographic image." If only one pantograph is used the platform "may be made to move backwards and "forwards in addition to its rotating motion."

The inventor claims also "methods of producing mechanical "sculpture." By means of photographs and the pantograph and strips of any material "capable of being divided into thin "sheets, cut, turned, stamped, or planed," the number of which "is determined beforehand on the model," each being "an exact "representation of a corresponding part of the model," he forms a whole, which on being united "will produce a piece of sculpture "similar to the model." Each strip "is produced at the same "time, and may be made mechanically in large quantities." The article may equal the model in proportions, or be of reduced dimensions, or be enlarged "by the aid of the pantograph or "solar microscope alone." He makes likewise "counterparts of "sculpture in bas-relief, or in the grotesque, whether the material "be of a hard or soft nature." The methods are described at length in the Specification.

[Printed 1*s.* 2*d.* Drawings.]

A.D. 1863, February 6.—N° 333. (* *)

BLAKELEY, THOMAS, and MEAKES, BENJAMIN.—(*Provisional protection only.*)—" An improved lead and stone pencil " sharpener," consisting of a piece of hard wood with a hole drilled into one side, " conical at one end and parlile at the other;" opposite the conical end is a recess cut in the wood to admit a knife which is made fast by means of a screw. There is a slot in the knife, so that it " can be regulated to cut with the greatest " accuracy, and can be taken out, sharpened, and replaced."

[Printed, 4*d*. No Drawings.]

A.D. 1863, April 10.—N° 910. (* *)

SMITH, ROBERT.—" An improved medicated oil for the preser- " vation of metal, wood, or stone." The invention consists of " an improved compound, herein-after described, to be used, " either alone or in combination with any description of paint, for " the preservation of iron or wooden ships, buildings, or articles " made of metal, wood, or stone;" it is also applicable for the " renovating of oil paintings and paintwork," and is composed of the following ingredients:—" One gallon of any descrip- " tion of oil, and a like quantity of water," to which is added " about 2 pounds of saltpetre, salt, or soda, either mixed or sepa- " rate." If the compound is intended for the preservation of stone, " about 2 pounds of soluble sulphur is added."

[Printed, 4*d*. No Drawings.]

A.D. 1863, May 29.—N 1354. (* *)

GREEN, WILLIAM. — " Improvements in the means or method " of producing black coloring matters or pigments." The patentee claims as his invention, first, " the production of black " pigments by the precipitation of the coloring matter of myra- " bolanes, galls, logwood, tannin, and such other materials as are " used in the manufacture of black writing inks and in dyeing " black in conjunction with the mordants that are used for such " purpose, and the application of such pigments, when dried, to " the purposes for which smoke, vegetable, and such blacks are " capable of being used either alone or in admixture with the " blacks of commerce." Secondly, the precipitation of the said pigments upon or in conjunction with a basis for the production of soft blacks, and the use of the base when simply stained with these coloring matters as a black pigment. Thirdly, the use of the pigments as water colours, in which case they are only partially dried, "or they may be mixed in their damp state with size or " other suitable vehicle, and dried for use as crayons, or as solid " ink in lieu of black lead." The process is as follows: — An extract or solution is made by boiling the coloring matters; it is then put into a vessel and allowed to stand until quite clear; " the mordant to be used is also, when a soluble one, dissolved " in water and left to clear itself; the two are then drawn off " and mixed in another vessel. When the color has subsided, " the mother liquor is drawn off, which is replaced by clean " water; the color is allowed again to subside, and the liquor is " drawn off as before, and this process repeated if necessary; the " color is then placed on filters, and allowed to drain; it is then " removed to the drying or heated room, where all remaining " moisture is driven off, in which state it is ready for use, or it " may be crushed or ground into powder, sifted, and so produced " in the shape of dust." He generally precipitates on a basis of china, clay, or carbonate of lead, or such a basis as will of itself form a black with logwood, gallic acid, or tannin, or such chemicals as do of themselves deposit a soft basis or strike a black with some of the dye stuffs, or the blacks of commerce. He sometimes mixes two of the dye stuffs, and sometimes uses more than one mordant. He cannot give any set proportions; he gives, however, three examples; " one a method of using logwood, " one of cutch or tanning matter, and one of galls or matters " containing gallic acid."

[Printed, 4*d*. No Drawings.]

A.D. 1863, June 3.—N° 1392. (* *)

MAURICE, Joseph.—(*Provisional protection only.*)—" Improve- " ments in rulers or instruments for ruling, and in the mode of " constructing them." Each end of a perfect cylinder of lignum vitae, ebony, or other wood, or of other substance, is reduced to form a pin on which the cylinder can turn freely in suitable plates; or a rod, secured at each end in an end piece, may be passed through a hole bored along the axis of the cylinder. Both cylinder and end pieces are placed in a frame of wood or metal, in which they can revolve freely. One or both edges of *the frame* form a bar against which the ruling instrument is pressed and guided. Or the cylinder may be fitted between two end pieces of a ruling frame, having a finger piece or means of moving the ruling apparatus backward and forward. To gauge the distance apart of the lines to be drawn, a hole is drilled at one or both ends of the frame for the reception of a gauge, which is a pin whereon a short metal or other tube or ferrule is made to slide; this tube is graduated with grooves or rings turned in it. Several tubes differently graduated may fit the same pin, or there may be several pins differently graduated. A scale of divisions of length, tables of weights and measures, &c. may be engraved on the frame or fixed thereto.

[Printed, *4d.* No Drawings.]

A.D. 1863, August 10.—N° 1969.

HEYNE, Bernard.—(*Provisional protection only.*)—" Improved " apparatus to facilitate sketching and drawing landscapes, " buildings, machinery, and other objects in correct perspective." To the front or outer edge " of any suitably shaped flat or inclined " topped table " (for convenience supported on folding legs) is fitted "a rigid vertical frame," constructed to hold a sheet of glass, which can slide into it or be fixed in it in any convenient way. This glass " may be marked with lines horizontally, " vertically, or diagonally, or marked off in squares or divisions " of any suitable figure for the purpose of practising the eye to " the relative proportions of the objects seen through the glass." From the rear of the frame, projecting backwards, is an arm (or arms) carrying " a small swivelling plate," through which is formed a sight-hole, "placed so as to be at an angle of, say, 45° " to the surface of the glass plate." The vertical frame may be so fitted to the table that it can be folded thereon, and the arm or arms may be so arranged " that they can be folded against or " towards the frame to which they are attached."

" The paper or other surface upon which the sketch is to be " drawn is placed upon the table; the operator then applies one " eye to the swivelling sight and commences the sketch. He " may use a pair of compasses to measure off the relative propor- " tions and positions of the various objects composing the view, " applying them to the surface of the glass and then to the " surface of the paper." Sometimes the paper is " marked off to " correspond with the marks on the glass."

[Printed, *4d.* No Drawings.]

A.D. 1863, August 26.—N° 2107. (* *)

FATTORINI, SANTINI.—(*Provisional protection only.*)—" A new " division of time and the application thereof to mathematical " and other instruments."

The said application may be made to " either mathematical, " philosophical, nautical, optical," or other instruments " such as " to the universal meridian, the sea and geometrical compass, " longitude and latitude maps, the celestial and terraqueous " globes."

" The division of the scales will be made in conformity with the " formula which determines the proportion that as four is to six " so eight is to twelve, and as twelve is to eighteen so is sixteen " to twenty-four, and so on with regard to the numbers of the " squares to infinity."

" The division of numbers or scale formed according to series of " proportions is applicable to the following instruments, namely, " the universal meridian, the sea and geometrical compass, the " longitude and latitude of maps, the celestial and terestial " globes, the protractor, the chronometer, pendulum, and watch, " the sextant, octant, and circle, the graphometer, the barometer, " the thermometer, the meter weights and measures, and the " universal almanack, thus creating a new division of time and " space, the desired result being attained by describing a circle " around a square and then a square about the circle, and so on, " thereby increasing the scales of divisions on each circle in the " various proportions before mentioned."

[Printed, 4*d.* No Drawings.]

A.D. 1863, October 20.—N° 2568.

PETTENKOFER, MAX.—" Restoring the surface of pictures in " oil without any danger to their original state." The picture is exposed " to an atmosphere saturated with vapour of alcohol " at the ordinary temperature (without applying heat)." The resinous particles of the picture " absorb alcohol from that atmosphere until they are saturated and not more." By this process " the different separated molecules reacquire cohesion with each " other, and the optical effect of the original is restored solely by " self-action, the picture not getting touched at all." Other substances can be used instead of alcohol, namely " wood naphtha, " *ether, sulph*uric and other ethers, turpentine, petroleum, ben-

" zine, and the various ottos," and in special cases "higher and " lower temperature is to be employed." The alcohol absorbed evaporates very soon when exposed to the ordinary atmosphere, " and the surface of the picture remains clear as long as a newly " varnished surface."

The most convenient apparatus for the above purpose is a wooden case, "about 3 inches deep, lined inside with some metal, " for instance zinc (with exception of the lid), to which the " picture or the pictures to be restored are fastened by screws." Alcohol is then poured into the metal-lined bottom of the case, and the lid is shut, " thus suspending the pictures face downwards " over the alcohol." The progress of the restoration must be watched, and those pictures which have absorbed sufficient vapour must be taken out. When a picture cannot well be removed from its place, a case is employed a little larger than the picture, but without lid and metal lining; the bottom is covered inside with flannel or the like which is slightly sprinkled over with alcohol, and the case is fastened over the picture so as to cover it completely. Other appliances may be contrived for the purpose.

[Printed, 4*d*. No Drawings.]

A.D. 1863, Deeember 7.—N° 3071. (* *)

TURNOR, MICHAEL. — " Improvements in pencil cases and " holders for crayons and other marking, writing, or drawing " materials, and in boxes for holding leads for pencils, crayons, " and other articles." The object of this invention is to prevent the lead, &c. from being forced back into the holder by the pressure used in writing. The tube in which the propeller slides is open jointed, and beside the slot is a rack with parallel slides. Attached to the propeller is a bent spring, on the front of which is a projecting stud which moves in the slot, and below the stud a serrated tooth which engages with the rack. The rack may be serrated and turned inwards at right angles, and the tooth rectangular. Or the teeth of the rack may be in the same plane as the slot, and the top of the propeller a piece of metal bent or doubled and split so that one part may move in the slot while the other engages with the rack. Or a rack may be formed by corrugating the tube on one or each side of the slot, and in the latter case, increasing the breadth of the tooth. The nozzle is provided with a lozenge-shaped opening for the ready removal of the lead end. Any of the arrangements may be covered with an outer case, when there must be an additional fixed tube. The sliding tube has an upper tooth and stud, engaging, when "the "action" is moved out of the case, with a transverse slot or rack cut in the fixed tube and case. Both studs work in a longitudinal slot in both tubes and case. The action carries at bottom a stop to limit the distance of its moving. "Instead of preventing the "return of the action into the case, by the slide engaging with a "transverse slot or rack near the middle of the case, the same "object may be attained by the slide being made to engage with "a transverse slot near the bottom of the case, or by a rotary "collar engaging with the slide, and preventing its motion in the "longitudinal slot."

The boxes are made from two metal blanks; the one forming the body is bent into the figure of a shallow rectangular tray with a projection on one of its shorter sides. The lid is of nearly the same shape as the body, except that its ends are open, and its lower edges are bent into a plane parallel with the middle part. The lid slides on the body, the bent edges engaging under the bottom thereof.

[Printed, 1*s*. 4*d*. Drawings.]

1864.

A.D. 1864, February 1.—Nº 270.

ROWSELL, Charles John.—(*Provisional protection only.*)— "Improvements in apparatus for viewing photographic and other "pictures, coins, and medals, which is also applicable in the pro- "duction of drawings and paintings." The inventor terms his apparatus a portable easel for viewing photographs, &c. It consists of parts hinged together at one end; the lower part forms a base; the upper may be raised and inclined at any angle by the aid of a strut foot, which is enclosed between the parts when they are shut. Towards the lower end is hinged a rest, against which the object to be viewed is placed; it "is fitted to the inclined

" board in a transverse bar, which can be slid lengthways of the " apparatus;" at the upper end "is mounted a hinged transverse " bar," whereon a magnifying glass is placed, a catch being provided to secure the glass-holder in its raised position.

In viewing single pictures "a large circular or other shaped " magnifying glass, through which a person can look with both " eyes," is employed; the frame that carries it is so fitted to the bar that it can be changed for another glass or glasses.

For viewing stereoscopic pictures "a thin black partition piece" is hinged to the inclined part; it can be "disposed at right angles " to the plane of the pictures or glasses," and being hinged it can " be laid down flat when viewing single pictures." A double eye-glass is substituted for the single one.

"To view glass shades, there is an opening through the picture " rest, in which is inserted a piece of ground glass."

The apparatus is applicable for drawing or painting pictures, " using it as an easel, and employing the magnifying glass to " view the work as it progresses."

[Printed, 4*d*. No Drawings.]

A.D. 1864, April 2.—N° 829.

POTTS, Ferdinand, and GREEN, Alfred Henry.—(*Provisional protection only.*)—" A new or improved combination easel, " and which easel may form a portable stand for music or other " purposes." This easel is formed with three or more standards " of segmental tubing," so that when they are folded together " they form a circle or other desirable form in the transverse " section." The standards are united at one end "by a suitable " joint and cap;" at the other they are stopped "with solid or " other suitable shanks for resting on the ground." The rest for the stretcher or board consists of "portable adjustable attach- " ments," so that they can "be applied when in use and removed " when not required." The whole when shut up is enclosed in a tubular case, except the shanks; these when united "represent a " strong spear," and "the easel within its case will form a highly " suitable climbing or walking staff." The case is fitted with a top; it may be painted or otherwise ornamented; and it may be used by the artist as a maul or rest-stick.

[Printed, 4*d*. No Drawings.]

A.D. 1864, May 26.—N° 1310.

BROWN, John Harcourt.—" Improvements in treating animal " substances for the manufacture of size, pulp, and pulpy matter, " and converting the said pulp or pulpy matter into sheets, slabs, " blocks, thread, hollow or tubular articles, and such other articles " of commerce, for which the said sheets, slabs, blocks, threads, " hollow or tubular articles may be applicable." The animal substances are "chiefly the skins or cuttings of skins," and among the articles mentioned are drawing and tracing paper.

The skins are soaked in soft cold water until they are soft and pliable; they are then cleansed from impurities and put into a bath composed of 1 part of American potash, 3 of unslaked lime, and 35 of water. These ingredients are to be boiled and frequently stirred for an hour or more; the lime must be allowed to deposit; the clear caustic liquor is to be poured off and raised to a temperature of from 70° to 100° Faht. The bath is to be kept up at this temperature "until the epidermis can be removed by hard " brushing or any other suitable means." When the epidermis is removed the skins are washed clean in cold soft water, and are then ready for conversion into size for paper makers "by the " usual methods."

For tracing paper, or " a substitute for tracing paper," the skins are converted into fibre. For this purpose the skins are crushed by stampers or the like "as thin as it is possible to spread them " out" and are then put into a lukewarm bath composed of 100 parts by measure of soft clean water and 1 part of sulphuric acid of ordinary strength. They remain in the bath " until they " assume a jelly-like appearance," when the liquor is drawn off. They are next submitted to a " clear bleaching liquor" until "the " fibrous effects are produced." The fibre, when " firm, hard, " and white" is taken out and washed in cold soft water "into " which some spirit or carbonate of ammonia is introduced to " kill the bleach." The fibre is now in a fit state to be made into sheets " by the usual machinery employed by paper makers."

[Printed, 6*d*. No Drawings.]

A.D. 1864, June 13.—N° 1454.

DE ST. MARTIN, Henri Reda.—(*Provisional protection only.*) —" Improvements in apparatus or instruments for describing or " drawing elliptical figures." The instrument "is a compass

" composed of three legs, two of which are to be not only " articulated at the point of junction," but " to be so connected " with the third leg by means of a ring or collar that they may " be enabled to revolve round it." One of these two legs is " principally used as a guide bar;" the other is tubular, for the reception of the shank of a pen or pencil, so that the shank " will " have a telescopic movement and serve the purpose of a " lengthening bar." In the third leg, " which when in use is " always to be maintained stationary and in a perpendicular " position," is a slot throughout a great part of its length " for " the reception of the axis or axle of a half ring or semicircular " plate," whose diameter " should bear a certain proportion to " the magnitude of the whole instrument." This half ring, moving up and down the stationary leg and turning on the axis, is adjusted by means of a screw to any inclination desired. The two revolving legs are connected with each other by a bar, " one " end of which is fixed to either of the legs though articulated at " its junction therewith, whilst the other end is made to slide up " and down the second leg."

After describing the method of using the instrument the inventor adds, " I propose also to enlarge or diminish the size of " the ellipse without shifting the position of the half ring on the " stationary leg by fixing a bar horizontally to the end of the pen " leg and connecting a pen or pencil with it in such a manner " that the said pen may slide upon the bar and be adjusted to " any diameter which it may be desired to give the ellipse."

[Printed, *4d.* No Drawings.]

A.D. 1864, August 16.—N° 2037.

DOVE, WILLIAM.—" Improvements in applying water-marks in " paper," as aids to instruction in writing, drawing, correspondence, and similar purposes. These water-marks are to be copies, patterns, and designs, such as may be required for the purpose of teaching the above-named subjects; they may be produced in the paper " by any of the well-known means and methods " while the paper is in the pulpy state, or " by remoistening the paper " after it is manufactured, and then subjecting it to the action of " wires, engraved, punched, or embossed plates or cylinders, or by " any other means." The pupil is to trace or mark upon these water-marks, " and thereby develope the true forms of such

" letters, figures, drawings, or designs," so that his hand " can " be taught to move freely in a prescribed manner," and his eye " may become educated to accuracy of form."

[Printed, 4*d*. No Drawings.]

A.D. 1864, September 22.—N° 2334.

RHODES, James.—(*Provisional protection only.*)—" Improve- " ments in adapting and applying pneumatic injectors to various " useful purposes." These injectors are compressible vessels of " vulcanized india-rubber or other elastic substance," made with a neck and stopper, and with an aperture through which their contents " may be forced by compressure."

The improvements consist (1) in connecting such vessels to brushes or pens for supplying ink or other colouring matters thereto; (2) in combining with such vessels " tubes or spouts," and using them to contain oil or other liquids;" (3) in combining tin, zinc, or other metal, or rigid material, with the elastic substance in the construction of such vessel; (4) in lining such vessels with " bladder, gold-beater's-skin, or other animal sub- " stance," when they are to contain liquids which would " act " upon and destroy or deteriorate the materials of which such " vessels are made."

[Printed, 4*d*. No Drawings.]

A.D. 1864, November 11.—N° 2800.

WILLIS, William.—" Improvements in processes for copying or " reproducing by the agency of light drawings, engravings, litho- " graphs, and photographs, and written and printed documents." By means of this invention " a copy may be produced, in which " the light and dark parts in the original are directly reproduced " in the copy, and are not reversed as in the ordinary method " of photographic printing." Bichromate of ammonia (30 grains) is dissolved in 1 ounce of water, to which is added dilute phosphoric acid (about 2 drams). " The adjustment of this acid in proper proportion to the chromate is a matter of great importance;" when the proper quantity is present, " the picture de- " velopes of a black colour." The sheet of paper whereon the drawing is to be reproduced is covered with the solution and hung up to dry in the dark. It is placed in a photographic printing frame in contact with the drawing, and is then exposed to light

" from two minutes to half an hour, according to the intensity of " the light." The impressed paper is now removed from the frame and laid on the bottom of a wooden box, which is as long and wide as the paper, but not more than two inches deep. Two or three layers of bibulous paper are nailed to the under side of the cover of the box, " and a dilute solution of aniline in benzole is poured thereon from a dropping bottle in rows of drops, " the rows being about two inches apart." The cover being laid on, the vapour of aniline " falls therefrom to the surface of the " impressed paper and blackens all those parts which have not " been exposed to the action of light;" the time required for this development will vary from ten minutes to half an hour. The copy is washed for a few minutes in plain water, or first in water, then in very dilute sulphuric or other acid, and again in water, when the picture will be fixed.

" The different stages of the operation " are sometimes varied " to suit certain peculiar requirements." Other solutions may be employed, but the patentee believes the above and the process above described " to be on the whole the best." Instead of aniline he occasionally uses for developing " toluidine or such other " volatile organic bases as possess the property of striking a black " or dark colour with chromic acid or chromates unacted upon by " light;" of these he prefers " the series known as the pyrrol bases." The developers admit of modifications, which he describes.

[Printed, 4*d*. No Drawings.]

1865.

A.D. 1865, February 8.—N° 352. (* *)

WILEY, William Edward.—(*Provisional protection only*.)—" Improvements in pencil holders and penholders, and in holders " for crayons and other marking, writing, or drawing materials," which are provided with sliding propellers. The improvement consists in fixing the propeller in any required position. The slide is carried by a spring on the upper side of the propeller; parallel to the longitudinal slot is a series of holes, and on the top of the spring is a pin which " is made by the elasticity of the " spring to enter one or other of the holes," thereby fixing the slide and propeller and preventing the marking material from being pressed back into the holder while in use. The holes may be made on the same side as the slot, or on the side opposite to it, if the pin and spring be arranged accordingly.

[Printed, 4*d*. No Drawings.]

A.D. 1865, February 11.—N° 394. (* *)

HILL, Edward Jacob.—" Improvements in pen and pencil " holders." The penholder is made in two parts; the one which holds the pen is hollow, cylindrical, triangular, or hexagonal, and from one to two inches in length; the other part works telescopic fashion either within or outside of the former; it has soldered to it a loop, hook, or ring, through which the writer's finger passes. This upper part and its loop may be readily applied to ordinary lead pencils; and pencil holders may be constructed in a similar manner.

[Printed, 6*d*. Drawing.]

A.D. 1865, February 15.—N° 435.

EMERY, Francis Joseph.—(*Provisional protection only.*)—" Improvements in ornamenting china and earthenware, and in " preparing material to be employed therefor." The colour is applied to the surface of the article " by means of crayons com- " pounded of a color suitable for being employed for ornamenting " china and earthenware, and also a flux suitable for vitrifying the " colour when subjected to heat." The colours are by preference made up into the form of crayons " by combining them together " with wax." The design is drawn on the surface, and the article is then submitted to heat, by which the colours are fixed. The surface may be either glazed or unglazed; " when glazed, the " surface of the glaze should be rendered rough by applying a " further glaze to the surface, which is only partly vitrified." If the surface is unglazed, it may be glazed after the colours have been applied to it.

[Printed, 4*d*. No Drawings.]

A.D. 1865, March 17.—N° 746. (* *)

WHEELER, Charles Anthony.—(*Provisional protection only.*)—" An improved apparatus combining a pencil shield and " india-rubber." The shield is a split tube, of any metal, plain or ornamented, open at one end and closed at the other. When the pencil is not in use, the pointed end is thrust into the shield; when in use, the shield is placed on the uncut end. A band of india-rubber surrounds the shield at or near the top of the closed end.

[Printed, 4*d.* No Drawings.]

A.D. 1865, July 14.—N° 1854.

CLARK, George.—(*A communication from Garcia de Morales.*)—(*Provisional protection only.*)—" An improved drawing instru-" ment," to enable draftsmen and engravers " to produce parallel and equidistant lines on plans, elevations, and drawings on paper, " stone, or metal." The instrument consists of (1) a square with a hole in it, (2) a lever on a pivoting screw or fulcrum between two supports which are screwed to the square, (3) a steel spring fastened to the upper face of the lever by a screw behind the fulcrum, (4) a shifting foot, (whose lower extremity " is tapered to a " knife-edge " and passes through the hole of the square), pinned to the lever in front of the fulcrum and bearing against the spring, (5) a regulating screw at the fore-end of the long arm of the lever.

In using the instrument the square is pressed against a flat ruler but so that it " may slide against it." Supposing the first line of the work to be drawn, " a finger of the hand in which the drawing pen is held is pressed upon the regulating screw," thereby depressing the lever. This movement of the lever gives to the foot " a point of resistance on the paper or metal on which lines have " to be produced." The foot communicates to the square " a " receding or backward motion," after which, " the finger being " removed from the regulating screw," the next line is drawn, and so on. The spaces between the parallel lines " may be " indefinitely varied," according as the lower extremity of the screw " is brought nearer to or further from the square."

[Printed, 8*d.* Drawing.]

A.D. 1865, October 9.—N° 2598.

ROBERTSON, John.—(*Provisional protection only.*)—" A new or " improved color slide and case for the use of artists and painters." The slides, suitably formed " to suit various shaped palettes," are made of " vulcanized india-rubber or other suitable material," and with or without a moveable back and partitions. They can be attached to palettes by springs or otherwise, and when not in use can be enclosed in a case. The case is made with or without a sliding top; it may be of the same material as the slide, "and " can be used to contain water" if desired.

[Printed, 6*d*. Drawing.]

A.D. 1865, October 10.—N° 2613. (* *)

NICHOLLS, Arthur.—" Improvements in rules for measuring, " and in other instruments or articles requiring to be adjusted or " disposed at various angles."

The object of the invention is to retain such articles at "the " required position when adjusted thereat."

A "middle plate" working in a socket is of a polygonal figure " or a figure having any desired number of sides or angles which " may be either pointed or rounded off." In the socket in which the said middle plate works, a blade spring is fitted " in such " position that it will act on" the middle plate, " and hold it in " any desired position to which it may be moved, but yet allow of " its position being shifted when required. The middle plate " may sometimes be toothed, notched, or serrated so as to form a " sort of ratchet wheel or disc, a spring catch pawl or clawker " engaging in its teeth or notches." A thumb spring may be used to retain the middle or working plate at any required position. " A screw may be fitted in the joint or contrivance above described " to act on the working plate, bar, or piece."

A stud or pin is sometimes placed "in the joint, fitting, or con- " nection, and another stud or pin in the end tip or other part of " the rule or other instrument, so that the latter may be easily " and accurately placed in position."

The drawing shows various modes of constructing the middle plate with notches, serrations, &c., the blade spring having at its free extremity a tooth of a corresponding shape. A set screw at the centre of the joint and having a milled head is also shewn in connection with a graduated arc upon the outer surface of the middle plate.

[Printed, 8*d*. Drawing.]

A.D. 1865, December 1.—N° 3083.

HANDLEY, Isaac John, and WILKINS, Charles.—(*Provisional protection only*.)—" Improvements in the manufacture of " compasses, callipers, and dividers."

The first improvement consists in employing "an adjustable "screw" instead of the ordinary permanent rivet, which forms the axis whereon the legs turn. The inventors prefer "a thumb "screw or a fly burr and screw."

The second consists in countersinking the inner part of the head or joint, "by which means the friction of the joint is "removed from its centre outwards, and thus the holding power "of the screw is increased."

[Printed, 4*d.* No Drawings.]

1866.

A.D. 1866, January 11.—N° 90. (* *)

DEAN, HENRY.—"Improvements in 'plotting' and 'com- "'puting' scales for the use of surveyors and engineers."

This invention consists principally "in combining a set of "plotting and computing scales in one;" the same divisions are "used for both plotting and computing."

The main scale is only marked with the principal divisions, the subdivisions "being made upon a supplemental sliding scale." The main scale is provided with a "longitudinal groove in each "edge running throughout its entire length, and in these grooves "is accurately fitted a sliding frame of metal composed of two "slides (one running in each groove), connected together by two "transverse bars passing at right angles to the slides and parallel "to each other across the face of the main scale." This sliding frame carries one or more supplemental scales. "A projection "from the sliding frame carries the 'station pricker' which is "a needle held up by a spring, but capable of being depressed so "as to puncture the paper when required." Another projection from the sliding frame carries the offset scale, which has a longitudinal groove in which a subdivisional scale works. The offset pricker is opposite to the zero of the scale. "The computing "frame is mounted upon the sliding frame in precisely the same "manner as the 'offset scale.' To the slide of the 'offset scale' "is attached a hinged flap, which may be folded down over either "graduated edge so as to cover up the subdivisions of the edge

" not in use, and thus prevent the possibility of error by reading " off the wrong scale. A similar contrivance may also be placed " upon the supplemental scales of the main sliding frame."

[Printed, 8*d*. Drawing.]

A.D. 1866, March 5.—N° 664.

STANLEY, WILLIAM FORD.—(*Provisional protection only.*)— " Improvements in mathematical drawing instruments." The first improvement consists in additional parts to a geometrical pen for producing the curves "known as the hypocycloid and epicycloid." Instead of the ordinary "head on the second or third wheel carry- " ing a marking point it carries one end of a bar" which "crosses " horizontally over the centre of the axis of the instrument and " is supported at the opposite end in a sliding fitting." The ink or pencil head is adjusted upon this bar.

The second in an additional part to a pen " used to produce the " geometrical curve known as the conchoid." The bed of the pen is made " in form of the letter T instead of L, whereby the " marking head may pass over the centre and produce the perfect " conchoid." The heads are constructed "to slide in grooves " and are clamped and adjusted where required, or they may " be clamped so as to form what is known as a semi-elliptic " trammel."

The third in additional parts to an instrument for producing " curves and radial lines, principally in perspective drawing, and " termed a rolling centrolincut." One of the bearings is so adjusted that, "when a large wheel is placed upon the axis, the " bearing may be raised so as to let the bed remain level," and instead of fixing the pen upon the end of the instrument, a bar is carried out upon which the head to carry the pen slides; this bar is divided "so as to give a required radius to the curve produced " by the pen." One of these additions may be used without the other.

The fourth in additional parts to an ordinary pair of compasses " for giving the perspective position of objects by reflection," or for astronomical purposes. "The optical principle of the sextant" is added thereto, " by means of which it is converted into a geo- " metrical drawing instrument, as any positions of objects may " be taken with it and directly transferred to the paper by means " of intersecting arcs."

The fifth is an addition to the fourth :—" If a pair of compasses

" be taken, the legs of which are parallel bars, and a point be " projected vertically from the joint by making a head which car- " ries a point or pen slide on each of the parallel bars, a compass " will be made that would take the position of any three points; " thus the instrument will appear as a beam compass jointed in " the centre with a point projected from the joint."

" The improvements, or any two or more of them, may be " combined in any way upon the same instrument."

[Printed, 4*d*. No Drawings.]

A.D. 1866, March 9.—N° 723. (* *)

HUMPHREYS, Henry Temple.—" Improvements in reflecting " optical instruments."

This instrument may be used to set out curves either in the field or on paper; also to measure angles, altitudes, and distances, and as a goniometer.

This instrument is called a "cycloscope," and "the principle " upon which all these applications depend is that of combined " or successive reflections between two plane mirrors."

The instrument is made "in the form of a short cylinder of " a length about equal to its diameter, with plane mirrors placed " at each end of the said cylinder; one of these mirrors is fixed " perpendicular to the cylindrical axis, and is silvered over its " whole area. The other is silvered over half its area only, and " is arranged to move angularly on an axis perpendicular to " the cylindrical axis. Suitable arrangements are constructed " whereby the angle subtended between the fixed and the " moveable mirrors may be very readily altered at will to any " angular magnitude required, by which means a series of reflec- " tors of any object looked at through a small hole in the fixed " mirror will appear in the half mirror ranged at regular intervals " and will fall upon the circumference of a mathematically true " circle, whose radius is thus mathematically determinable. The " curve is set out by planting poles or pins at uniform distances " in the line of direct vision with the images seen in the half " mirror."

[Printed, 8*d*. Drawing.]

A.D. 1866, May 2.—N° 1236. (* *)

BENVENUTI, Fortuné François.—" An improved feeding " holder, applicable to writing and drawing pens." An essential feature of this invention is "that it admits of writing and drawing "or ruling pens being attached to the same feeding holder." The holder is a tube of glass, metal, ebonite, or any other material; if it be of glass or ebonite it has mountings of metal. The top is provided with a screw cap, through which the upper end of a piston rod protrudes. On the lower end of the rod is a cork or other substance capable of working in the holder freely but air-tight; the cork is secured to the rod by a stud at top and bottom. At the lower end of the holder is a circular opening, through which the ink is poured in. The opening is constructed to receive an air-tight screw, to which the penholder or drawing pen, together with a capillary tube, is screwed, the latter being in communication with the interior of the holder. The piston rod is furnished with a stop to prevent its "being pushed down "inadvertently." The rod may be arranged to work by the screwing and unscrewing of the cap.

[Printed, 6*d*. Drawing.]

A.D. 1866, July 10.—N° 1809.

CUTHBERT, JOHN SPRECKLEY.—"Improvements in painters' "easels." A swinging frame (on which the picture is placed) is mounted "somewhat in the manner of a cheval glass, but in front "of the standards, which are inclined forwards, they being erected "from the back part of the base frame and suitably strutted." The swinging frame is connected by hinges or by other suitable pivots, "the point of support being, say, one fourth or one-fifth "the length of the frame from the top;" the bottom "comes just "above the base of the easel, which is furnished with a quadrant "rack and pawl, whereby the backward or forward position of "the bottom of the frame can be regulated at pleasure." This gear is in connection with a treadle, so that the artist can adjust the incline with his foot. The swinging frame is made with an inner sliding frame, which is provided with "a rising screw rest "for the picture at bottom" and "a sliding lengthening frame "or bar at the upper part" to accommodate different sizes of pictures.

The bar frame stands on castors, one of which has an adjusting screw "to obtain an equal bearing on the floor." The lower cross bar of the inner sliding frame "is furnished with a metal socket "bearing receiving a small winch handle shaft," which works also in a socket formed on a metal bracket fixed to the crossbar. This bracket carries "a bearing for the lower end of a long screw" having at its lower extremity a pinion that gears with a wheel fixed on the winch shaft, and the upper portion of the screw works in a nut fixed to the upper crossbar of the swing frame. Rotating the screw by the winch handle, "which is conveniently "disposed in front of the easel," raises the screw through its nut and with it the bracket and its frame. In the lengthening frame (which is moved by cord and pulleys) slides "a clip frame" for holding the top of the picture.

Modification:—In lieu of the bevel gear and screw a fixed rack may extend from the lower crossbar of the swing frame to "the "centre of oscillation," and a spring catch fastened to the lower crossbar of the inner sliding frame takes into the rack; the motion of the frame is rendered easier by the help of counterbalance weights.

[Printed, 1*s*. 4*d*. Drawings.]

A.D. 1866, September 3.—N° 2257. (* *)

FROST, Richard.—"Improvements in means or apparatus to "be employed in order to facilitate the teaching of writing and "drawing." Three inventions are described. The first is the employment of a tablet of cardboard or other suitable substance for the objects set forth in the title. The tablet has in it a rectangular or other shaped aperture, which, when it is placed upon the paper, slate, &c. exposes only the required amount of surface for a line of writing or for a drawing. Copy models are fixed by pins or other means to the upper portion of the tablet, or may be printed thereon. This portion of the tablet may be in the same plane as the lower portion or slightly raised above, either parallel or inclined to the writing or drawing surface. The above arrangement may be modified; the upper portion may be made separate from the lower and connected to it by spring clips or other contrivance. The aperture may be formed on a separate piece of cardboard capable of turning round. The tablet may be provided with rollers, round which a number of models (mounted on web, &c.) may be wound, and slots may be cut in the tablet to permit of so doing; or one roller may be arranged to effect the same object. The tablet may be furnished with a frame, in which a number of sheets are fixed; on one side of the frame are notches so that when one line of writing is completed the paper may be passed up; a spring catch takes into the notches. Or the sheets may be loose or formed into a book, and have on them spots or lines corresponding with marks on the side of the aperture.

The second relates to means of "teaching the correct position "in which to hold a pen." This is accomplished by means of two guide wires, connected at their ends to two other wires fixed to two standards on the tablet; the penholder is flattened and placed between the guide wires—one wire will answer the purpose if the holder have eyes or slots in it.

The third is a method of "teaching the pupil to make straight "strokes." For this purpose a ruler is employed, capable of sliding upon oblique guides (affixed to the tablet) when pressed upon by the pen or pencil, and returning to its position by means of a spring or springs.

[Printed, 10*d*. Drawing.]

A.D. 1866, November 3.—N° 2853. (* *)

NORTH, Edward Parsons.—"A new or improved portable or folding reading desk, stand, or easel." The pillar is either tubular or solid; if tubular the bottom is made capable of sliding on a square or angular rod affixed to the foot. The support consists of two rods jointed to each other at their middle, so that the one which extends sideways can be folded parallel to the other. One end of the rod is united to the foot in such a manner that the support may be placed on either side of the pillar; the other end is jointed to a stay whose top is connected to the pillar by a sliding socket. At the upper portion of the pillar is an arm sliding on it by means of a socket, and the arm carries a desk made in two halves jointed together and attached to the arm by a sliding socket and plate. The arm is jointed to its socket and can be fixed at any angle by a wedge, which is "situated behind the "central knuckle" of the joint, and works in an opening in the socket by means of a rod and coiled spring. The desk socket slides on the arm and clips it by aid of "a nearly tubular "spring" (covered with leather), which is placed inside it. The plate which unites the desk to its socket turns freely on a pivot or *centre* at the back of the socket. Each socket has its fixing screw. *The folding* support may be replaced by a fixed base; or the bottom of the pillar may be bent at right angles and enter a socket underneath a chair.

To make a double reading desk two arms are employed; the pillar is telescopic; the socket of one arm slides on the upper, that of the other on the lower tube; and the inner end of the lower arm is more curved than that of the upper.

A table can be formed by depressing the upper tube until the two desks are in the same plane.

[Printed, 8*d*. Drawing.]

A.D. 1866, December, 8.—Nº 3241.

DAVIES, JAMES.—(*Provisional protection only.*)—" An improve-" ment in parallel rulers." The inventor calls his ruler " a pro-" portional parallel ruler," that is to say, " a ruler for ruling " parallel lines at given distances without the aid of dividers or " scales."

At about the middle of the ruler, and, by preference, near the ruling edge, is fitted " a rolling drum, divided at different portions " of its periphery into different proportions by small holes." A small plate free to slide on a rod parallel with the drum carries a pin; this, as the drum revolves, " takes successively into the " holes which are in the plane to which the plate is set." When the ruler is in use a button on the plate is pressed upon by the finger to cause the pin to take into the holes; a spring beneath the plate raises it when the pressure is removed.

The drum and pin " may be used in conjunction with the " rolling drums now sometimes fitted to parallel rulers."

[Printed, 4*d*. No Drawings.]

APPENDIX.

A.D. 1804, June 20.—N° 2774. (* *)

PYKE, Lyon.—" A certain improvement on pencils, which I " intend to denominate Pyke's patent improved pencils." The pencil, either square or round, is from five to six inches in length, " $\frac{5}{8}$ of cedar wood," "with a guage or rule on the back of the " receiving part." The rule is made of metal, ivory, bone, or anything "susceptible of being engraved, stamped, or marked " on," and "is marked as a measure" by eighths of an inch. " The pencil contains two slide pencils, one at each end;" the one "of black lead of the best quality," the other "for creta " gallica (or for crayon of all sorts)." As "the inlaid guage or " rule part will last or wear out many slides," the patentee engages to sell " separate slides or pencils of two lengths to fit " the guage or rule part."

[Printed, 6*d*. Drawing.]

A.D. 1811, April 5.—N° 3430.

VARLEY, Cornelius.—" A new construction of a telescope or " optical instrument for viewing distant objects, and for other " useful purposes, with a suitable table or stand for the same." This invention "consists in combining one or two reflecting sur- " faces with a simple kind of telescope that inverts the object, " and thereby gaining an erect image without any additional " length to the telescope, placing the telescope out of the way of " the image, and apparently projecting the said image flat on " a table, so that it may be easily traced on paper, &c., the image " being seen by one eye, and the pencil or tracer by the other, or " by both eyes." The invention includes also a table or stand for supporting and using the telescope.

The object glass is achromatic. "A plain polished speculum" is placed "at an angle of 45° to the axis of the tube." A short neck receives "the eye piece placed at right angles to the tube." " The larger eye piece" is composed of "two plane convex lenses" placed "with their convex sides to the eye." "A small plane " reflecting metal speculum" is "placed before the eye glass at

" an angle of 45°," and in order that the artist may see the image and the surface upon which it is to be drawn at the same time, it is reduced " in the middle at the top to a sharp edge," the upper edge being made " to extend nearly through the cone of rays " coming from the eye glass." This smaller speculum is fixed by screws in a short tube which slides in " the neck of the eye " piece," and the upper side of the tube and of the neck " is filed " away so as to be in a line with the cone of the eye piece." Stops or diaphragms " prevent false light from being reflected " from the insides of the tube," and " the insides of the eye " pieces " are " turned in rings like the threads of a screw to " prevent light being reflected therefrom." A cap keeps the smaller speculum clean when not in use. A neck " fitting in the " larger one " receives " the smaller eye piece " and keeps the edge of the smaller speculum " at the same distance from the " tube as the speculum of the largest eye piece." The eye pieces are made " to slide into the neck rather than screw in, that the " telescope may be turned either to the right hand or to the left." Modifications of certain parts are described, and alterations " when " very high powers are wanted."

The stand :—" A framed table " is supported by a " front leg " made of three bars " jointed firmly together at the bottom," and two other legs each made of two pieces jointed at the bottom. The legs arranged so as to " form triangles with each other " are attached to blocks under the table by seven pins, so that they can be taken on or off. The telescope is supported at one end by two triangular frames hinged on to the sides of the table, and at the other by a similar frame hinged to either frame (as circumstances require) and carrying a sliding piece notched to hold that end. A bar hooks on to one of the two frames; it is perforated with holes " to receive a pin in the side of the slide." If the object is to be shown " reversed," the telescope " is supported " under the frame " by a piece " sliding through the frames," and at the back by another triangle carrying " a similar slide."

[Printed. 1*s*. Drawings.]

A.D. 1826, July 24.—N° 5392.

JOHNSTON, William. — " Improvements on inkholders." The patentee describes an inkstand, a fountain pen, and a fountain pen " combined with a pencil or crayon case." The present series has to do only with the last.

The portion of the case which belongs to the pen consists outwardly of a cylindrical ink chamber closed at one end, and attached at the other to a penholder. The ink passes from the chamber to the nib through a channel which is opened and closed by a stopcock. The cock has fixed to it a lever, which can be worked "by the finger of the writer." A cap carrying a pin inside it encloses the nib when not in use; the pin enters the channel "for the purpose of preventing the accidental escape of " the ink," and the channel "from becoming closed by the " drying of the ink."

The portion forming the pencil or crayon case is outwardly a tubular continuation of the ink chamber with a "conical point " conductor" at its outer end. Within the outer case is a tube, slotted its whole length, and within this tube is another tube also slotted from end to end, and cut with a screw on its outside. A steel rod to which the pencil or crayon is attached by a spring clip moves up and down the inner tube. The upper end of the rod is "turned-up" to protrude through the slot of the tube, and the up-and-down motion is caused by two collars on the screw which "embrace the turned-up end." Each collar is provided with "a small square piece extending on the side" and passing into the slot of the outer tube. The pencil or crayon is pushed out or drawn in by turning the conductor.

[Printed, 6*d*. Drawing. See London Journal (*Newton's*), vol. 12, p. 246.]

A.D. 1833, October 12.—N° 6485. (* *)

COOPER, Robert Burton, and ECKSTEIN, George Frederick.—"An instrument or apparatus for pointing pencils, " and certain other purposes." This invention "consists in com" bining or forming an instrument or apparatus by setting two " files, or other sufficiently hard and rough surfaces, at an angle " to each other, and thus leaving a longitudinal, concave, angular " space between them, which instrument or apparatus, so formed, " may be constructed separately, or may be attached to other " instruments, according to the purpose to which it is to be " applied." In pointing a black lead or other pencil by this instrument, the pencil is placed in the groove in an inclined position, and rubbed backwards and forwards with a certain amount of pressure, "continuing to turn it round in order that " all parts may be equally reduced by the files." This instrument may be used for pointing penholders and "the stilletoes of

" ladies' workboxes," also for producing a " concave " [convex ?] end to metal pipes, preparatory to soldering them.

A slate is shown having the above-described instrument let into the frame. The back of a knife, in another instance, forms the angular and rough surfaces. In another construction, the angle suited to the purpose is formed between two cylindrical files mounted on parallel axes.

Instead of two files, one bent piece of metal may be used.

[Printed, 6*d.* Drawing. See London Journal (*Newton's*), vol. 7 (*conjoined series*), p. 32.]

A.D. 1843, December 8.—N° 9977. (* *)

BROCKEDON, William. — Improvements in preparing or treating black lead.

The patentee states "that it is well known that in cutting black " lead and otherwise shaping black lead, much powder or dust " thereof is produced, a given weight of which is of small value " when compared with a like weight of black lead of equal " quality, hence it is desirable to cause the powder or dust of " black lead to be again rendered solid, so as to allow of its being " again cut for the making of black lead pencils."

By this invention the black lead in a state of dust is solidified by pressure in dies. This is done more effectually by withdrawing the air from both dies and powder "before operating by pressure." Parts of the interior of the bed of the die are cut out of sufficient depth and width to receive the powder (to be made into a block) and four wedges, two on each side; the parts left being a segment at top and bottom, and two "solid bearings" or projections parallel with them. When two of the wedges are placed alongside of the projections, " their sides form a hollow parallelopiped " to hold the powder; the other two wedges are driven firmly in next the segments. Round the die is a rim cut so low that " a " dome may rest on it below the die for the lead." The dome is further secured by a stud, which is affixed to it and "enters " a groove formed in one of the solid parts of the die." The dome has on its top a stuffing box, through which a "condensing " plunger " descends, and lower down " a nozzle, to which a pipe " communicating with an air-pump is attached when in operation." The air is pumped out, the plunger is " driven down " by a powerful fly-press or stamper, and the condensation " is effected. In order that the block of lead thus formed may be taken out of the cavity more easily after the wedges are removed, the sides of the projections "are not quite parallel, and will " readily deliver on the widest side."

[Printed, 8*d.* Drawing. See Repertory of Arts, vol. 4 (*enlarged series*), p. 285; London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 13.]

A.D. 1846, March 25.—N° 11,149.

SMITH, CHARLES.—" Improvements in cooking and culinary " utensils, and methods of heating and suspending or fastening " articles of domestic use, and similar purposes." The patentee divides his inventions into eleven heads, and under the ninth head he claims "the modes of making articles for holding books " open," also "the combination of easel with the methods of " attaching the parts, and turning them and holding them in " any suitable position."

"Plan No. 3, division 9," figure 11 shows the back part of a closed box with "a hinged moving rod or prop" attached thereto "so as to serve the purposes of an easel."

Figure 15 represents a stand with a table top revolving on a pin and socket and held in place by a thumbscrew. The stand also carries a horizontal bar having at one end a sliding "counter-" poise weight," and at the other a "screw support bar" and socket for an easel or bookholder. "The desk part" is hinged at the top to a continuation of the support bar, and is held in any inclined position by a "quadrant circular bar" and thumbscrew. Bent plates sliding in inclined slots hold the book, &c. on the desk part, and "candlestick, inkstand, and powder-box" are attached to the top of the support bar.

Figure 16 shows "a method of holding the easel part to the edge of a table "or like article" by a clamp and thumbscrew.

[Printed, 3*s.* 6*d.* Drawings. See London Journal (*Newton's*), vol. 29 *con-) joined series*), p. 356.]

A.D. 1851, January 16.—N° 13,458. (* *)

COGAN, ROBERT.—Application of glass to various purposes; amongst them to pens and pencils. The patentee claims "the " application to pens and pencils of a hollow moveable glass case, " which may be made to answer the purpose of a handle," so that they may be carried in the pocket without risk of injury. The case is especially adapted to glass pens, the stem of which should be made much shorter than usual, and inserted into the case when required for use; at other times "the pen can be "reversed and the point inserted." The stem should be ground to fit the handle and made with a flange or stop to prevent it from being thrust too far in.

[Printed, 8*d*. Drawing. See London Journal (*Newton's*), vol. 41 (*conjoined series*), p. 24; Mechanics' Magazine, vol. 55, p. 77; Patent Journal, vol. 11, p. 197.]

A.D 1852, October 13.—N° 370. (* *)

PINKNEY, Robert.—"Improvements in cases for holding "marking materials." The advantages, which the patentee claims for his invention, are length of marking lead and simplicity of parts. The holder is composed of an outer case, a cap piece, a short screw, a driver, an internal tube, and a point carrier. The outer case is a plain cylinder of wood, ivory, metal, or other material; "it has an internal screw thread or groove cut upon it "from end to end." To this screw thread is fitted "a very short "screw of metal or other material," bored through the centre so that the internal tube may pass through it. This tube, which receives the lead, and which "may be made square or polygonal "for the reception of crayons," &c. has a longitudinal slot from end to end; it is connected at one end to the cap piece, "turned "down at its inner end, and inserted with a little stiff friction "into a short bored out socket in the upper end of the holder;" the other end of it "is capable of revolving in a small bored socket "inserted in the end of the outer case, and screwed externally to "receive the separate point carrier." The short screw is put into connection with the tube by means of a wire forming the driver, which is fast in the screw and enters the slot. To charge the tube the point carrier must be unscrewed. The lead is thrust forward by turning round the cap and with it the tube; and as the driver passes through the slot, it must necessarily cause the short screw to revolve.

[Printed, 6*d*. Drawing.]

A.D. 1853, January 15.—N° 105.

TASKER, Edward.—"An instrument called 'The writing and "drawing tube.'" A slip of metal is formed into a tube with "a slot or opening throughout its entire length," and with one end tapered "so as to reduce the aperture of the tube at that end "to the exact size" of the marking material to be used. When the material, which is as long as the tube "except about one "quarter of an inch," is introduced, a propeller is put in at the rear. The propeller is provided with a stud whose stem slides in the slot. As the tube is elastic, the edges press the stud-stem "with a sufficient force to prevent its sliding back in the act of "using the instrument," but allow it "to be moved backward "or forward by the finger."

[Printed, 4*d.* No Drawings.]

A.D. 1855, May 18.—Nº 1120. (* *)

WARÉE, Benoit Theodore.—(*Provisional protection only.*)—"A new or improved apparatus for sharpening pencils." The patentee describes his invention thus:—It "consists chiefly of "a suitably-cut straight, sectorial, annular, and wheel-like file, to "which a respectively straight reciprocating motion, or a circular "to-and-fro motion, or (for the annular wheel or barrel file) a continuous rotary motion is imparted with respect to the pencil "to be sharpened. When a straight file is used, I form dovetail slides in a suitable wooden box or frame for the file to be "slided to and fro; the pencil is supported by a V or notched "bar in front of the file, and by a center or adjusting screw at "the hinder end, the screw being raised above the notched bar "in such manner that the point of the pencil meets the file at "the angle required. The pencil holder must also have a collar, "and be capable of being lengthened as it wears, so as always to "present the same angle to the file when it is being sharpened. "The pencil being thus laid down, a reciprocating motion is imparted to the straight file, and the pencil turned all the while "about its axis. The V bar is adjustable, so that every point of "the file may be applied in turn, and the file worn equally "throughout. When a sectorial file is used, the file is fixed "down upon a suitable plate, and an angular to-and-fro motion "given to the pencil, which is suitably inclined, as before, "and supported. When an annular file is employed, the file "is fixed upon a disc, which by means of a winch handle is set "to rotate, whilst the pencil or crayon is turned and supported at a suitable angle, in a way similar to the one first "described above. A similar arrangement may also be adopted "with regard to a vertical wheel, which has a file cut on its "circumference."

[Printed, 4*d.* No Drawings.]

A.D. 1856, April 29.—N° 1017. (* *)

RAMMELL, THOMAS WEBSTER.—" Improvements in pen and " pencil holders." The outer case of this improved holder, " in " place of being made with a simple slit with parallel sides, is " made with a slit having on either side enlargements " or holes. The internal tube " is split longitudinally throughout the whole " of its length, so as to enable it to spring over and hold tightly " the end of the pencil." It has also a longitudinal split for a portion of its length " so as to form an elastic tongue." On the tongue are a projection (which fits into the holes of the case) and " a rib " with a button or plate attached to its upper edge. Pressure on the button releases the projection and allows the internal tube to slide in the case.

[Printed, 6*d*. Drawing.]

A.D. 1857, May 30.—N° 1524. (* *)

CLARK, WILLIAM STETTINIUS.—(*A communication.*)—(*Provisional protection only.*)—" Improvements in machinery for the " manufacture of an instrument for sharpening watch-cleaning " sticks used by watchmakers, said instrument being also appli- " cable to the sharpening of small wooden cylinders for other " purposes, such as lead pencils, &c." The " sharpener " consists of a hollow cone of metal, open at the base, and having a handle at the top. A steel blade extends from the top to the base; there is a slot under its cutting side. When a pencil is introduced into the sharpener and turned round, the blade will plane it to a fine point. The slot enables the shavings to escape. The invention relates to an improvement in the apparatus for casting the above-described sharpener, and consists in the arrangement of a gauge for the purpose of varying the depth to which the edge of the blade shall be placed in the core of the mould before casting, and of a spring holder and sliding plates which hold the blade in the mould and form the slot by shutting off the composition from the front edge of the blade.

[Printed, 6*d*. Drawing.]

A.D. 1857, November 10.—N° 2842. (* *)

HARRINGTON, JOSIAH.—" Improvements in apparatus for " pointing pencils or marking instruments." The apparatus consists of a wooden frame having in it a conical recess for receiving the end of a pencil and a bevilled groove, into which is inserted a plate with a series of slots sharpened on one or both sides and notches on its upper and lower edges. The plate is held in its position in the groove by a spring catch, the end of which drops into one or other of the notches. Both frame and plate may be made of a cylindrical form. If the recess be made in the circumference of the cylinder, the cutting plate must be mounted on an axis and secured in its place by a screw which enters small holes drilled in the edge.

[Printed, 6*d*. Drawing.]

A.D. 1857, December 18.—N° 3111. (* *)

DARLING, SAMUEL.—(*Partly a communication from Joseph W. Strange.*)—" An improved pencil sharpener."

This instrument differs from the ordinary conical pencil sharpener in having a second smaller hollow cone " whose axis " is at a right angle " to that of the larger one. This cone is armed with a separate knife; or the knife of the larger cone may be made to extend with one of its ends into the smaller one, which end is sharpened to form a cutting edge. The wood only of the pencil is cut away in the larger cone; the lead is pointed in the smaller one. The patentee claims also the arrangement of a lead receiving recess in the ring or handle of the instrument, which recess is in connection with the throat of the wood reducing cutter.

[Printed, 6*d*. Drawing.]

A.D. 1858, February 16.—N° 295. (* *)

DAFT, THOMAS BARNABAS.—" Improvements in instruments " for rubbing out pencil-marks and for sharpening pencils." The frame of this instrument is a cylinder of wood or a block of any other form. Through the wood a hole is bored in which is fixed the sharpener. The frame is wrapped round with a strip of india-rubber in a plastic or doughy state; rings or ends of india-rubber are then applied, and the article is complete. The sharpener is manufactured from a blank of steel of size and shape to form a hollow cone, one edge of which is sharpened and adjusted so as to cut a pencil when inserted and twisted round. The above instruments may be made separate or combined.

[Printed, 6d. Drawing.]

A.D. 1858, February 24.—N° 370. (* *)

FOSTER, Walter Kittredge.—"An improvement in the "manufacture of blades for pencil sharpeners, or other articles of "like nature." The object of this invention is to support small pieces of metal and aid in their reduction to wedges or knife blades under the action of a grinder or grinding wheel. For this purpose the patentee forms in the upper surface of a plate of metal one or more series of recesses "triangular in cross section," and "parallel to each other, or in such other manner as circumstances may require." Each recess is intended to receive a knife blank, which "by resting against the two sides of the recess "will take an inclined position with respect to the top surface of "the bed or holder." This holder, so made, "is to be used under "a grinding stone or grinder, which should be made to revolve in "such a direction, while it is operating against a knife blank, "that such knife blank shall be forced by the friction of the "grinder against the vertical side of the knife recess." After a blank has been reduced on one side, "it may be turned over, and "that side placed downward within the recess, so as to bring the "other side of the blank uppermost."

[Printed, 6*d*. Drawing.]

A.D. 1858, June 7.—N° 1284. (* *)

HICKS, Robert.—A composition to be employed as black lead. This invention "consists in forming a composition of black schist, "carburet of iron combined with other substances known in "Devonshire and elsewhere by the name of shining or shiny "ore, and plumbago of commerce, and with or without soda and "lampblack. Or in forming a composition of black schist and "carburet of iron, with or without soda and lampblack." The patentee states the proportions of the said ingredients which he uses (but does not limit himself thereto) "for polishing stoves, "grates, and other iron articles, as also for protecting the same "from rust;" also "in making crucibles, furnaces, and stoves," and "in lieu of black lead in making pencils." In the last case, the ingredients are reduced to a fine powder, thoroughly mixed with a small quantity of water, and then put into a strong metallic mould and subjected to considerable pressure. The composition is afterwards sawn into slabs, baked in a kiln or oven, heated gradually, and retained there long enough to harden to any degree required.

[Printed, 4*d*. No Drawings.]

A.D. 1860, January 31.—N° 255. (* *)

COLE, RICHARD JOHN.—"Improvements in pencils and in "holders for the same." "The object of this invention is to "render that part of lead and other pencils or their holders, which "is held between the fingers, less rigid, thereby giving a certain "amount of elasticity to that part." Cedar pencils and the like are manufactured in joints or strips, having metallic spiral or other suitable springs, or a piece of vulcanite india-rubber at or near the centre, "so that the spring may be moved upwards as "the pencil diminishes in length," the lead not being glued in, but left loose. Camel's hair and similar pencils may be treated in like manner. In metal cases or holders, "ornamented scales or "divisions" are used, beneath which is a spring "of thin straight "strips, spiral, or other convenient form." Holders are made of vulcanite, horn, or material "that can be softened and again "rendered hard, or nearly so," by winding strips thereof into a spiral form with a wire inside slightly larger than the lead intended to be introduced. The orifice at the point is a little smaller to prevent the lead from falling out, and the edges of the holder do not quite meet, as between them is placed a propeller, "consisting of a piece of serpentine sheet metal, with a pin "soldered or brazed through its centre."

[Printed, 4*d*. No Drawings.]

A.D. 1860, February 27.—N° 534. (* *)

MELVILLE, ALEXANDER.—"Improvements in the preparation "and manufacture of compounds for marking on paper and other "fabrics and substances." The patentee claims the invention of compounds, to be employed for writing, drawing, and marking on paper and other fabrics and substances, the marking produced by which is "of an indelible character and irremoveable by "ordinary reagents." In the specification are three receipts with the proportions which he prefers, but he does not confine himself thereto. The first consists of plumbago or other carbonaceous matter intimately mixed with gum cowrie, tallow, soap, alum, or *proto-nitrate* of iron or other metallic salt, coal bitumen, and vegetable black; any suitable coloring or staining substance may be introduced. The second, of plumbago, fuller's earth, fine plaster of Paris, vegetable black, gum acacia, and for saturation, tallow, and bitumen of Judea or other mineral pitch or coal tar pitch. The third, of plumbago, or other carbonaceous matter, or any suitable substance which contains staining and dyeing properties, fuller's earth, vegetable black, bitumen or coal tar pitch, tallow, alum, or proto-nitrate of iron, or other metallic salt or salts; the third may be improved for some purposes by adding thereto sulphate of copper, prussiate of copper, proto-sulphate of iron, and gallic acid. "In those cases where gallic acid or proto-" nitrate of iron is employed, prussiate of potass, prussiate of " iron, ferro-cyanide of manganese, or the ferro-cyanides of any " of the metals, may be substituted for the gallic acid or proto-" nitrate of iron, or may be employed in combination therewith, " and may be used as fixing agents." The machinery, &c. for manufacturing the above does not form any part of the invention, " which relates solely to the compounds herein-before mentioned " and described."

[Printed, 4*d*. No Drawings.]

A.D. 1861, March 4.—N° 545. (* *)

JAMES, John.—" An improved instrument for sharpening slate " pencils, blacklead pencils, lead pencils, crayons, and such like " articles." The base piece of this sharpener is of wood or other material; it has in it a conical groove, over whose edges two steel cutters slightly project, fastened thereto by screws, working in slots (either in base or cutters), and thus supplying a convenient means of adjustment. Each cutter is double edged, or a square one may be used having all its edges sharpened. Instead of two cutters on opposite sides of the same groove, two grooves are sometimes made end to end in the base piece, and one cutter projects over both.

[Printed, 6*d*. Drawing.]

A.D. 1861, March 20.—N° 703. (* *)

TOWER, Levi Lincoln. — (*A communication from Francis Pickard Hale, junior.*)—" Heads for lead pencils, ink erasers, and " other articles of like character." To rub out pencil marks the head is made of india-rubber alone; to erase ink marks, about one-tenth part by weight of powdered emery or its equivalent is added thereto. The mould in which the head is formed is composed of three metal plates, namely, a cap, middle, and core plate, united by studs on the cap and core, which enter corresponding holes in the middle one. The mould, with the india-rubber inside, is subjected for a few moments to the action of both heat and pressure. The head may be either round or pointed; it has a socket formed in its lower end, by which it is attached to the chamfered end of a pencil.

[Printed, 6*d*. Drawing.]

A.D. 1861, November 26.—N° 2965. (* *)

WILLIS, Augustus William.—"Improvements in the con-"struction of pencil cases or holders." This invention is a substitute for the ordinary port-crayon. A tube of metal, wood, or any suitable substance, is formed of length and bore sufficient to admit a cedar black-lead pencil; it is open at both ends and slotted from one extremity to nearly the other. Within the tube works a solid propeller, furnished at one end with two or more steel points, and on one side with a stud which moves in the slot. Or the tube may be of metal, "the edges of the skelp being "brought together but not soldered," and one end being secured by a ring or by soldering the edges; in this case the projection on the propeller should be in the shape of a slip or knife edge. The pencil is fixed by pressing one end on the points, and the top of the tube is covered by a moveable cap.

[Printed, 4*d*. No Drawings.]

A.D. 1862, May 12.—N° 1415. (* *)

WALKER, Henry.—"Improvements in making handles for "crochet needles, pencils, penholders, and other articles." The handles are made of paper or cloth, scaleboard, twine, or any convenient material, alone or in combination with paper. In making holders for crayons, lead or slate pencil, the patentee prefers to roll paper round tubes made of the above materials. Paper of width and length suitable to the article required is besmeared on one side with glue or other adhesive matter, and wound round a spindle of proper shape. When the spindle is withdrawn, the tube is covered with ornamental paper (especially "*porcupine* paper") or japan varnish, or varnish mixed with colored pigments. According to the shape of the spindle, so the tube is round, oval, oblong, tapering, &c. He makes handles for crochet needles and penholders which indicate "by the hands of "the users thereof the true position of the crochet needle, pen, "or other implement held by them," and others having a flattened or slightly hollow piece on one or both sides, that the thumb and first finger may keep the handle with its needle in its proper position.

[Printed, 4*d*. No Drawings.]

INDEX OF SUBJECT MATTER.

[The numbers refer to the pages in which the Abridgments commence. The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent.]

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    Storer, 6.

Anastatic printing. *See* Copying.

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ERRATUM.

Page 27, line 14, *for* "Mordon" *read* "Mordan."

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These books are of 12mo. size, and each is limited to inventions of one class only. They are so arranged as to form at once a Chronological, Alphabetical, Subject-matter, and Reference Index to the class to which they relate. Inventors are strongly recommended, before applying for Letters Patent, to consult the classes of Abridgments of Specifications which relate to the subjects of their inventions, and by the aid of these works to select the Specifications they may consider it necessary to examine in order to ascertain if their inventions are new.

The following series of Abridgments do not extend beyond the end of the year 1866. From that date the Abridgments have not been published in classes, but will be found in chronological order in the "Chronological and Descriptive Index" (*see* Section II. of this List of Works). It is intended, however, to publish these Abridgments in classes as soon as the Abridgments of all the Specifications from the earliest period to the end of 1866 have appeared in a classified form. Until that takes place the Inventor (by the aid of the Subject Matter Index for each year) can continue his examination of the Abridgments relating to the subject of his invention in the Chronological and Descriptive Index.

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* *See* Notice on page 16.

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——— (*Library*).
——— (*Mechanics' Institution and Literary Society*).
——— (*Philosophical and Literary Society*).
——— (*Working Men's Institute*).
——— (*Young Men's Christian Association*).
Leighton Buzzard (*Working Men's Mutual Improvement Society*).
Leith (*Mechanics' Subscription Library*).
Lewes (*Mechanics' Institute*).
——— (*School of Science and Art*).
Lincoln (*Mechanics' Institute*).

Liverpool (*Institute*).
——— (*Mechanics' Institute*).
——— (*Medical Institution*).
——— (*Polytechnic Society*).
Llanelly (*Chamber of Commerce and Reading Room*).
London (*Athenæum Club, Pall Mall*).
——— (*Beaumont Institute, Mile End*).
——— (*Bedford Working Men's Institute, Spitalfields*).
——— (*Birkbeck Institution, Southampton Buildings, Chancery Lane*).
——— (*Bow Common Working Men's Club, Devon's Road, Bow Common*).
——— (*Christchurch Working Men's Club, New Street, Lark Hall Lane, Clapham*).
——— (*Clerkenwell Club, Lower Rosoman Street*).
——— (*Holloway Working Men's Club and Institute, Holloway Road*).
——— (*Literary and Scientific Society, Wellington Street, Islington*).
——— (*Literary and Scientific Institution, Walworth*).
——— (*St. James and Soho Working Men's Club, Rupert Street, Soho*).
——— (*St. Mary Charterhouse Working Men's Club, Golden Lane*).
——— (*South London Working Men's College, Blackfriars Road*).
——— (*Southwark Working Men's Club, Broadwall, Stamford Street*).
——— (*Spring Vale Institution, Hammersmith*).
——— (*Working Men's Club, Brixton Hill*).
——— (*Working Men's Club, St. Mark's, Victoria Docks*).
——— (*Working Men's Club and Institute, Battersea*).
——— (*Working Men's Club and Institute Union, Strand*).
——— (*Working Men's College, Great Ormond Street*).
Loughborough (*Working Men's Club and Institute*).
Madeley (*Anstice Memorial, Workmen's Club and Institute*).
Manchester (*Ancoats Branch Free Library*).
——— (*Athenæum*).
——— (*Campfield Free Lending Library*).
——— (*Chorlton and Ardwick Branch Free Library*).
——— (*Hulme Branch Free Library*).
——— (*Law Library*).
——— (*Mechanics' Institution*).
——— (*Natural History Museum, Peter Street*).
——— (*Owen's College*).
——— (*Portico Library, Mosley Street*).
——— (*Rochdale Road Branch Free Library*).
——— (*Royal Exchange Library*).

Mansfield (*Co-operative Industria Society*).
——— (*Mechanics', Artizans', and Apprentices' Library*).
Melksham (*Mutual Improvement Society*).
Merthyr-Tydfil (*South Wales Institute of Engineers*).
Middlesborough (*Iron and Steel Institute*).
(*Mechanics' Institution*).
Modbury (*Mechanics' Institution*).
Mossley (*Mechanics' Institute*).
Newark (*Mechanics' Institute*).
Newcastle-upon-Tyne (*Mechanics' Institution*).
——— (*Working Men's Club*).
New Mills, near Stockport (*Mechanics' Institute*).
Newport, Isle of Wight (*Young Men's Society and Reading Room*).
Northampton (*Mechanics' Institute*).
Nottingham (*Free Library*).
——— (*Mechanics' Institution*).
——— (*Subscription Library, Bromley House*).
Oldham (*Analytic Literary Institution*).
——— (*Mechanics' Institution, Werneth*).
Ormskirk (*Public Library*).
Oswestry (*Institute*).
Patricroft (*Mechanics' Institution*).
Pembroke Dock (*Mechanics' Institute*).
Pendleton (*Mechanics' Institution*).
Penryn (*Working Men's Club and Reading Room*).
Perth (*Mechanics' Library, High Street*).
Peterborough (*Mechanics' Institution*).
Plymouth (*Working Men's Institute*).
Poole (*Literary and Scientific Institution*).
——— (*Mechanics' Institute*).
Portsea (*Athenæum and Mechanics' Institution*).
Preston (*Avenham Institution*).
——— (*Institution for the Diffusion of Knowledge*).
Rawtenstall (*Mechanics' Institution*).
Richmond (*Working Men's College*).
Rotherham (*Rotherham and Masbro' Literary and Mechanics' Institute*).
Royston (*Institute*).
Ryde, Isle of Wight (*Philosophical and Scientific Society*).
Saffron Walden (*Literary and Scientific Institution*).
St. Just (*Institution*).
St. Leonard's (*Mechanics' Institution*).
Salford (*Working Men's Club*).
Saltaire (*Literary Institute*).
Selby (*Mechanics' Institute*).
Sheffield (*Branch Free Library*).
——— (*Literary and Philosophical Society, School of Arts*).
Skipton, Yorkshire (*Mechanics' Institute*).

Southampton (*Hartley Institution*).
——— (*Polytechnic Institution*).
Southport (*Athenæum*).
South Shields (*Working Men's Institute and Club*).
Spalding (*Mechanics' Institute*).
——— (*Christian Young Men's Association*).
Staines (*Literary and Scientific Institution*).
——— (*Mechanics' Institute and Reading Room*).
Stamford (*Institution*).
Stourbridge (*Church of England Association*).
——— (*Iron Works Reading Room and Library*).
——— (*Mechanics' Institution*).
——— *Working Men's Institute*).
Stratford (*Working Men's Hall*).
Sunderland (*Working Men's Club*).
Swansea (*Royal Institution of South Wales*).
——— (*Working Man's Institute*).
Tavistock (*Mechanics' Institute*).
——— (*Public Library*).
Thornton, near Bradford (*Mechanics' Institute*).
Thornton Heath, Croydon (*Workmen's Club*).
Todmorden (*Mechanics' Institution*).
Truro (*Cornwall County Library*).
——— (*Institution*).
——— (*Royal Institution of Cornwall*).
Tunbridge Wells (*Mechanics' Institution*).
——— (*Society of Literature and Science*).
Turton near Bolton (*Chapel Town Institute*).
Tynemouth (*Free Public Library*).
Ulverston (*Temperance Hall*).
Uttoxeter (*Mechanics' Literary Institute*).
Wakefield (*Mechanics' Institute*).
Watford (*Literary Institute*).
Wells, Somerset (*Mechanics' Institution, Grove Lane*).
——— (*Young Men's Society*).
Whaleybridge (*Mechanics' Institute*).
Whitby (*Institute*).
——— (*Museum*).
——— (*Subscription Library*).
Whitehaven (*Mechanics' Institute*).
——— (*Working Men's Reading Room*).
Whitstable (*Institute*).
Wisbeach (*Mechanics' Institute*).
Wolverhampton (*Library*).
Wolverton (*Institute*).
Woodbridge (*Literary and Mechanics Institute*).
——— (*Working Men's Hall*).
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——— (*Workman's Hall*).
Workington (*Mechanics' Institution*).
York (*Church Institute*).
——— (*Institute of Popular Science &c.*)
——— (*Railway Library*).

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——— (*Hon. Soc. of Inner Temple*)
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——— („ „ *Middle Temple*).
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———————— Odd Fellows' Library Association, San Francisco.
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B. WOODCROFT.

July 10, 1871.

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